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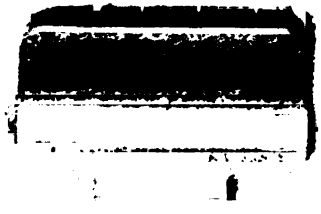

STATE OF WASHINGTON

BUREAU OF STATISTICS AND IMMIGRATION

MISCELLANEOUS PUBLICATIONS

State of Washington

BUREAU OF STATISTICS AND IMMIGRATION

J. GRANT HINKLE

SECRETARY OF STATE, EX-OFFICIO COMMISSIONER

The Advantages

AND OPPORTUNITIES OF

WASHINGTON

"THE EVERGREEN STATE"

For Homebuilders, Investors and Travelers

By HARRY F. GILES
Deputy Commissioner

OLYMPIA
FRANK M. LAMBERSON, PUBLIC PRINTER
1907

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CHUCKANUT DRIVE, A SECTION OF THE PACIFIC HIGHWAY.

STATE OF WASHINGTON

DEPARTMENT OF STATE

Bureau of Statistics and Immigration

J. GRANT HINKLE, Secretary of State

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FOREWORD

This publication has been prepared to take the place of "The Homeseekers' Guide to the State of Washington," the popular book now out of print issued by the Bureau of Statistics and Immigration several years ago. It represents an effort to satisfy the more common questions asked regarding this great state and its various subdivisions, cities and towns. Although somewhat more comprehensive than the former publication it is clear that in a book of this character exhaustive details cannot be given and that some questions will be necessarily unanswered, even if it were possible to anticipate them in every instance.

The county descriptions have been arranged in groups according to location and in the order that one might expect to visit each section when making a trip about the entire state, rather than alphabetically. It is felt that this plan will assist the reader in getting a comprehensive idea of each district and from a comparative standpoint.

A few pictures have been inserted, to suggest the scenes which are most common or to indicate the kind of development which has already taken place and which can be duplicated with intelligent effort.

Figures showing the acreage of unreserved and unappropriated federal lands are from the United States report of July 1, 1919. State land figures were supplied by the Commissioner of Public Lands for April 1, 1920.

It is hoped that the publication will at least serve as a reliable guide for those desiring information regarding this rapidly growing state of the Pacific Northwest, and that investors, homebuilders, and pleasure seekers will be encouraged to investigate further and perhaps make a special trip to see for themselves.

It should be added that all of the larger cities and towns have active commercial organizations with secretaries who will be glad to answer special questions regarding their respective localities. Further information whenever available will also be cheerfully supplied by the State Bureau of Statistics and Immigration, Olympia, Washington.

A FEW HYDROELECTRIC SITES.

1—Kettle Falls, Columbia River. 2—In Rainier National Park. 3—On the Olympic Peninsula. 4—Metalline Falls, Pend Oreille River. 5—Chelan Canyon. 6—Near Seattle and Tacoma. 7—Near Spokane.

WASHINGTON—A SUMMARY OF ITS RESOURCES AND PROGRESS.

The State of Washington comprises the extreme northwestern section of the United States proper, and is the last land before embarking on the great Pacific for the rich empires of the Orient, including Japan, China and Siberia, and the starting place for that most wonderful of all our dominions, the Territory of Alaska. Our British allies hold the country bounding the state on the north, the State of Idaho limits it on the east and the majestic Columbia marks the dividing line from our other sister state, Oregon, on the south.

A number of harbors, unsurpassed for their commercial advantages and picturesque settings, penetrate its coastal shores, and Puget Sound, the yachtsmen's paradise, one of the most beautiful and expansive inland seas, reaches with its numerous arms well into the interior and permits the commerce of the world to ride at the very doors of its largest cities.

Washington was admitted to the Union in 1889 and occasioned the forty-second star being added to the field of blue. As a territory it was originally a part of Old Oregon, which included as well all Oregon, all Idaho, and Western Montana; and it was not until 1863 that it assumed its present boundary limitations.

Although one of the last territories to be granted statehood, its progress since has been almost phenomenal. In a comparatively brief period it has made strides in practically every line of human endeavor, so that today it ranks as one of the foremost in agriculture, fisheries, manufacturing and commerce, and is recognized as possessing a larger variety of attractions that appeal to the tourist than any other equal section of the world.

But greater things may be expected when its untouched mines are explored, its vast water power developed, and the lands now idle made to yield like the comparatively limited area at present under cultivation. In order to encourage the earliest possible development of these resources and at the same time open up to the ever increasing tide of tourists the scenic

wonders that can be found only in the Pacific Northwest a program for road construction on a large scale has been planned and is being carried out as rapidly as the funds become available.

Washington is a state well worth the consideration of those seeking a location for either a city or farm home, other fields for investment or new scenes for enjoyment and vacation.

AREA AND POPULATION.

In area this state ranks twenty-first among the 48 states in the Union. Within its borders are 66,836 square miles of land and 2,291 square miles of water, making a total of 69,127 square miles: just 18,157 square miles larger than Java with over 28 million people, nearly half the size of Prussia with a population of over 40 million, 10,552 square miles more than England and Wales together with their population of 36 million, and nearly equal to the combined area of New York, Maryland and Massachusetts with a total population close on to 14 million. Its extreme breadth is 364 miles and its greatest distance north and south 238 miles.

Between 1900 and 1910 it made the biggest percentage of increase in population of all the states in the Union. The 1920 census recorded a total of 1,356,621 for the state, which represents an increase of 215,226 or 18.8% over that of 1910.

TOPOGRAPHY.

The most conspicuous topographical feature is the forest-covered Cascade mountain range which extends in a slightly southwestern direction from Brtish Columbia to the Columbia river. The average height of this range is from 5,000 to 8,000 feet, but several peaks push their snow-crowned summits far above the others and are visible from nearly all parts of the state. The highest of these is Mt. Rainier (or Mt. Tacoma), 14,408 feet; Mt. Adams, 12,307 feet; Mt. Baker, 10,730 feet; Glacier Peak, 10,436 feet; and Mt. St. Helens, 9,470 feet.

The first mountain mentioned above is the dominant figure in Rainier National Park, set apart and maintained by the United States Government for the pleasure of tourists who come from all parts of the world to enjoy its mighty glaciers, its lakes and waterfalls, its meadows, its forests, and trails, and possibly

to climb to its dizzy summit, where the state may be viewed at a single glance. The others, too, are reached by roads and trails and all are attractive goals for mountain climbers and others who love Nature in her perfect pristine glory.

This mountain range separates the state into two nearly equal parts commonly known as Eastern Washington and Western Washington, with quite decided differences in topography, soil, climate and vegetation.

WESTERN WASHINGTON.

Western Washington includes the scenic and resourceful but undeveloped Olympic Peninsula, partially enveloped by the rugged Olympic Mountains; Puget Sound with its many beautiful islands, and the large mainland counties rising from its shores to the highest crests of the Cascades; and the rolling to hilly southwest region draining into Grays and Willapa harbors and the lower Columbia river.

Practically all parts were recently covered with very dense forests of fir, cedar, hemlock and spruce, and there still remain some of the thickest bodies of timber to be found anywhere in the world. Several million acres, however, particularly that closest to the salt water and the lakes and rivers or reached by the main lines of the railroads, have been "cut off" and sections placed under cultivation; but by far the largest area from which the merchantable timber has been removed is still in the logged-off condition.

The country other than the mountainous regions is made up principally of valleys of varying extent and importance, level to rolling plateaus or table lands, and intervening hilly sections, nearly all of which is fit for some form of agricultural development.

The most prominent upland soils are clay and sandy loams, while the low lands are rather of the silty loam variety with occasional pieces of alder bottom, peat, muck and beaver dam. At the deltas of some of the rivers are also extensive areas of tide lands, very rich in soil elements and splendid for agricultural development when dyked. A considerable area of prairie land is found in several of the southwest counties and a little in the northeast of Clallam county.

The leading crops are grasses, oats, potatoes and other roots, tree fruits and berries. For soft tree fruits and berries there is probably no place that excels Western Washington. For many years hops were a main product in some quarters, and the superior success of bulbs is being proved on the Government bulb farm at Bellingham. Throughout the region dairying is the most important agricultural enterprise.

EASTERN WASHINGTON.

Among the most conspicuous natural features of Eastern Washington are the Columbia river and its many tributaries, including the Snake which joins it near the southern boundary; the Okanogan Highlands comprising the four northern counties lying between the Cascades and Idaho; the Blue Mountains overlooking the valleys and wheat fields in the southeast; and the Columbia Plain comprising nearly all the remaining territory, including the "Big Bend," the "Palouse," and a number of rich irrigated valleys. There is some diversity in the agricultural trend of the different sections on account of variations in altitude, precipitation and local topographical features.

OKANOGAN HIGHLANDS.

The four northern counties of Eastern Washington constitute the Okanogan Highlands, made up of several low mountain ranges covered with forests of pine, spruce and tamarack, alternating with rich valleys, all trending in a general north and south direction. The principal valleys are the Methow, the Okanogan, the Upper Columbia, the Kettle River, the Curlew, the Colville, the Pend Oreille and the San Poil. Nearly all crops common to other parts of Eastern Washington are successful; but most attention is given to livestock, dairying, hay and fruit. Much development is now taking place in this section of the state and big things are planned for the future.

COLUMBIA PLAIN.

The remainder of Eastern Washington comprises chiefly what the geologists have called the Columbia Plain, supposed to be the bed of the ancient John Day lake, which covered as well parts of Oregon and Idaho. Its average altitude ranges from about 500 feet near the Columbia river to about 2,500 feet

on the higher ridges. River valleys, "coulees," and hills locally called mountains alternate with extensive stretches of level or undulating country.

The soil is mainly a decomposed basalt and commonly called "volcanic ash." It is rich in minerals such as iron, lime, potash and phosphoric acid and varies in depth from 12 inches to 100 feet or more. Bunch grass was once common on the higher levels and sage brush in the valleys, but now the higher altitudes are devoted to extensive wheat raising and the valleys are being rapidly placed under irrigation and devoted to tree fruits (especially apples), alfalfa and all other crops that will grow in a temperate zone.

CLIMATE.

The climatic differences of each section of the state will be referred to briefly in connection with the thirty-nine county descriptions. As a whole all parts of the state although in a comparatively high latitude enjoy a climate of unusual mildness and general equability. This advantage is due partially to the warm Japan current and the protection afforded by the mountains and forests. Scarcely any freezing weather occurs in Western Washington, and in Eastern Washington it is never severe. The highest summer temperature is attended with high humidity, and sunstrokes are unknown. The evenings are comparatively cool but favorable to plant growth.

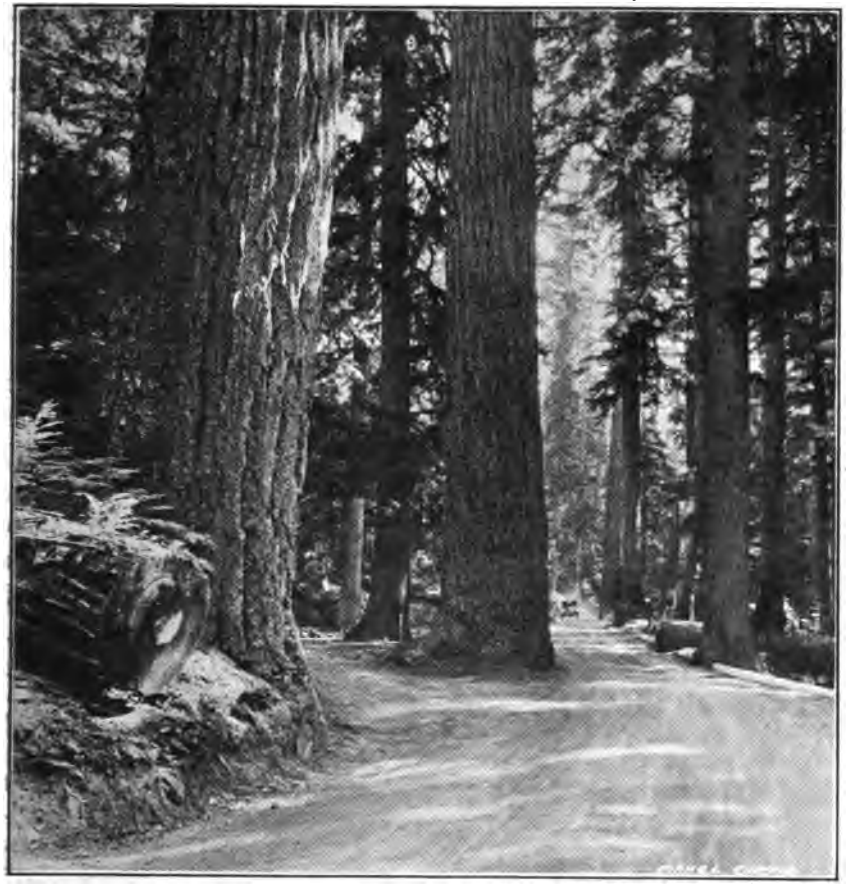
The annual normal temperature for Western Washington, averaged from a long period of years, is about 51 degrees, for the country in the vicinity of Spokane about 48 degrees, and near Walla Walla 53 degrees. The lowest monthly normal for the same period in the vicinity of Seattle is 39 degrees, near Spokane 27 degrees, and near Walla Walla 33 degrees. The highest monthly normal near Seattle is 64 degrees, at Spokane 69 degrees, and in Walla Walla county 74 degrees.

The most vital climatic variation is in the precipitation. In Western Washington it is mostly all in the form of rain, but a higher percentage of snow occurs in the eastern counties.

CLIMATOLOGICAL DATA FOR SPECIFIED STATIONS: AVERAGED FOR PERIOD OF YEARS DURING WHICH RECORD WAS KEPT.

CITY OR TOWN AND COUNTY	Elevation (feet)	TEMPERATURE						PRECIPITATION		SNOWFALL		PREVAILING WIND		FROST DATA			
		Mean Annual		Mean Annual Maximum		Mean Annual Minimum		Mean Annual		Mean Annual							
		L'gth of Record (yrs.)	Degrees (Fah.)	L'gth of Record (yrs.)	Degrees (Fah.)	L'gth of Record (yrs.)	Degrees (Fah.)	L'gth of Record (yrs.)	Inches	L'gth of Record (yrs.)	Inches	L'gth of Record (yrs.)	Direction	L'gth of Record (yrs.)	Average Date First Killing Frost in Autumn	Average Date Last Killing Frost in Spring	Average Length Grow'g Season (days)
Aberdeen, Grays Harbor	162	22	49.8	21	58.6	21	41.2	23	84.57	19	18.0	22	W.	22	Oct. 27	Apr. 23	186
Anacortes, Skagit	60	9	49.2	9	57.5	9	40.6	21	28.12	.....	.....	.....	.....	9	Nov. 5	Apr. 9	208
Bellingham, Whatcom	60	18	50.1	19	58.6	19	41.7	23	30.49	16	10.7	10	S. E.	18	Oct. 18	Apr. 22	177
Bremerton, Kitsap	40	5	51.1	5	59.9	5	42.3	16	40.98	.....	.....	.....	.....	5	Nov. 6	Apr. 12	206
Centralia, Lewis	212	21	50.8	19	61.3	19	40.3	23	45.94	17	14.1	13	S.	18	Oct. 14	May 6	159
Coupeville, Island	150	13	50.0	13	58.0	13	42.7	15	21.32	14	11.1	13	W.	12	Nov. 3	May 14	205
Olga, San Juan	50	24	49.1	22	56.0	22	42.4	24	30.77	20	10.0	22	S. E.	22	Nov. 8	Apr. 8	213
Olympia, Thurston	35	36	50.3	36	59.8	36	41.1	37	54.96	21	12.6	21	S.	36	Oct. 28	Apr. 22	188
Port Angeles, Clallam	29	14	46.7	14	53.6	14	39.9	16	29.81	14	24.1	14	S.	14	Oct. 21	Apr. 15	188
Port Crescent, Clallam	259	15	46.1	15	53.0	15	39.2	22	42.05	15	16.6	15	W.	15	Oct. 29	Apr. 4	207
Port Townsend, Jefferson	80	39	49.9	20	56.7	20	43.0	43	20.68	19	9.3	19	N. W.	19	Dec. 2	Mar. 22	254
Seattle, King	248	23	51.4	23	58.2	23	44.6	24	34.36	22	15.8	21	S. E.	22	Nov. 22	Mar. 22	244
Sedro Woolley, Skagit	38	17	50.2	17	60.1	17	40.4	18	46.40	.....	.....	.....	.....	17	Oct. 18	Apr. 30	170
Snohomish, Snohomish	55	19	50.3	19	59.4	19	41.2	20	43.52	.....	.....	.....	.....	18	Oct. 19	Apr. 23	178
South Bend, Pacific	140	16	51.1	16	60.1	16	42.0	19	58.13	12	4.5	4	W.	15	Oct. 31	Apr. 22	191
Tacoma, Pierce	213	17	50.6	17	58.0	17	43.3	30	42.27	17	16.1	17	S. W.	16	Nov. 19	Mar. 14	249
Union City, Mason	10	14	50.4	13	60.5	13	41.1	16	58.13	14	26.8	14	S.	13	Oct. 20	Apr. 28	174
Vancouver, Clarke	100	37	52.2	17	62.2	17	42.4	43	38.42	15	9.6	16	N. W.	16	Nov. 11	Apr. 15	209
Vashon Island, King	40	22	50.6	21	57.8	21	42.9	27	39.75	19	11.5	22	N.	18	Nov. 17	Apr. 4	227
Ole Elum, Kittitas	1,930	16	44.9	16	57.6	16	32.2	16	24.50	16	89.0	16	N. W.	16	Sept. 8	June 3	95
Colfax, Whitman	2,300	20	47.9	20	60.3	20	35.4	27	22.13	17	38.0	.....	.....	20	Sept. 16	May 23	114
Colville, Stevens	1,635	33	45.5	15	59.5	15	32.4	26	17.60	15	39.9	14	S. W.	15	Sept. 9	May 26	134
Conconully, Okanogan	2,300	15	45.0	15	57.4	15	32.7	15	16.65	15	49.5	14	S.	15	Sept. 24	May 15	130
Crescent, Lincoln	2,510	15	46.0	15	57.9	15	33.9	16	16.34	14	35.3	14	S. W.	14	Sept. 20	May 22	121
Cusick, Pend Oreille	2,050	8	44.8	8	57.7	8	32.0	10	24.94	.....	.....	.....	.....	.....	.....	.....	.....
Ellensburg, Kittitas	1,570	25	46.5	23	58.8	23	34.3	26	9.56	20	37.3	17	N. W.	22	Sept. 22	May 13	130
Kennewick, Benton	368	21	54.4	19	67.0	18	41.3	25	6.46	17	12.9	4	S. W.	18	Oct. 15	Apr. 23	174
Lind, Adams	1,700	9	50.8	9	63.6	9	39.0	10	12.02	.....	.....	.....	.....	.....	.....	.....	.....
Lyle, Klickitat	700	18	50.7	15	61.6	15	40.2	19	25.87	17	56.1	12	W.	17	Oct. 17	Apr. 26	174
Moxee, Yakima	1,000	23	49.9	23	64.0	23	35.5	25	8.35	22	25.3	.....	.....	23	Sept. 21	May 17	127
Republic, Ferry	2,623	13	43.2	13	56.9	13	29.6	15	16.19	13	46.7	14	N. W.	14	Aug. 30	June 10	80
Spokane, Spokane	1,943	34	48.1	34	58.2	34	38.2	34	17.47	30	37.4	34	S. W.	33	Oct. 13	Apr. 12	183
Sunnyside, Yakima	740	19	50.8	19	63.8	19	37.7	21	6.79	19	14.1	17	N. W.	19	Oct. 5	May 4	153
Walla Walla, Walla Walla	1,000	29	53.4	29	68.1	29	43.7	43	17.16	29	23.0	29	S.	29	Nov. 8	Mar. 30	222
Waterville, Douglas	2,624	23	44.3	21	56.4	21	32.1	24	12.68	22	56.6	14	S. W.	20	Sept. 21	May 25	117
Wenatchee, Chelan	1,169	16	47.7	16	57.9	16	37.4	16	13.57	15	59.6	11	W.	16	Oct. 24	Apr. 24	182
Wilbur, Lincoln	2,208	15	45.1	15	58.5	15	31.8	18	13.67	15	31.4	15	S. W.	15	Sept. 1	June 16	76

The greatest rainfall of Western Washington is near the Pacific ocean and the lowest is in the northeast section of the Olympic Peninsula. Immediately around Puget Sound it varies but the accompanying table shows that the general average is about the same as for the city of Chicago.



A mountain drive through the pristine forest.

In Eastern Washington the precipitation is lowest in the southern half of Grant county, where it is also lowest for the entire state, but it increases gradually in all directions with the altitude, until it averages 17.5 inches at Spokane, 17.2 inches at Walla Walla, 13.6 inches near Wenatchee, about 10 inches at Ellensburg, over 16 inches at Republic, about 16 inches at Goldendale, and 25 inches at Cle Elum. In the lower Yakima valley about 7 inches is the average.

CROPS.

The leading commercial crops, named according to their values in the year 1919, are wheat, hay, apples, oats, potatoes, barley, peaches, corn, pears and hops. Of these wheat amounted to $85,814,000, hay to $43,838,000, apples to $34,785,000, oats to $11,904,000, potatoes to $10,512,000, barley to $5,589,000, corn to $2,997,000, peaches to $3,248,300, pears to $2,890,000, and hops to $2,613,000. Other crops that went above a million dollars each in value were plums and prunes, sugar beets, berries, melons, and miscellaneous vegetables. All crops together amounted to about $225,000,000. In apples this is the leading state in the Union, in hops the fourth in importance, and in plums and prunes the third. Special crops that do well and which will increase in importance are bulbs, flowers, vegetable seeds, flax, English walnuts and filberts.

DAIRYING, LIVESTOCK AND POULTRY.

Climate, vegetation, markets and transportation facilities all favor stock raising, dairying and poultry raising. The first can be successfully carried on in any county but the more remote regions are usually chosen for it on the largest scale. Dairying as a whole has advanced most in the western part of the state, but certain districts in Eastern Washington are also unsurpassed in this respect and boast of some of the best dairy herds in the country. Hogs are raised both as a side product and as a special industry. There are altogether in the state, 18 condenseries, 19 cheese factories, and 110 creameries. All dairy products amount to from 20 to 30 million dollars annually.

VALUE OF DAIRY PRODUCTS FROM JUNE 30, 1914, TO JUNE 30, 1919.

	Year Ending June 30, 1915	Year Ending June 30, 1916	Year Ending June 30, 1917	Year Ending June 30, 1918	Year Ending June 30, 1919
Condensed milk	$5,618,050	$6,252,393	$8,670,825	$14,632,146	$15,044,709
Cheese	187,477	196,031	390,525	327,959	597,859
Butter	6,146,774	5,833,818	6,533,477	7,629,628	11,916,761
Milk retailed	3,479,393	3,744,801	3,457,350	3,730,500	7,078,558
Sweet cream retailed	4,304,000	3,355,247	1,035,967	1,121,982	2,987,244
By-products	.....	.....	.....	.....	2,811,312
Totals	$19,735,694	$19,384,790	$20,288,144	$27,442,165	$39,986,441

Sheep raising is successful almost anywhere, but most of them are at present raised on the grazing lands of Eastern Washington. The foothills are used for the summer pasture and the valleys in the winter. In 1918 there were 640,000 fleeces

sheared with an average weight of 8.6 pounds per fleece or a larger average than any other state in the Union. Goats are confined chiefly to Western Washington, where they are made very useful in helping to clear the land of brush and stubble. Horses and mules also do well in all sections.

The total actual number and value of all livestock and poultry in the state for the years 1914 and 1919, according to the census figures of county assessors, are shown in the accompanying table.

NUMBER AND VALUE OF LIVESTOCK AND POULTRY IN WASHINGTON FOR THE YEARS 1914 AND 1919.

(From Reports of State Board of Equalization.)

	1914		1919	
	Number	Actual Value	Number	Actual Value
One-year old horses	23,445	$1,072,676	23,961	$814,423
Two-year old horses	25,471	1,498,749	34,228	1,275,154
Horses, three years old and older	45,176	3,408,298	44,743	2,941,288
Work horses	156,614	18,081,884	160,207	17,445,132
Stallions	1,170	473,671	1,080	717,810
Mules and asses	14,905	1,638,492	18,669	2,133,320
Stock cattle	186,288	6,238,222	251,263	9,577,088
Milch cows	162,444	10,466,882	185,780	12,548,876
Bulls	6,400	405,078	7,342	1,124,150
Stock sheep and goats	440,789	1,916,846	642,129	6,827,136
Hogs	157,337	1,628,842	128,851	1,778,900
Poultry	.....	1,114,191	.....	1,071,243
Total values	.....	$47,911,831	.....	$58,254,020

PUBLIC LANDS.

The total land area of the state is 42,775,040 acres. Of this approximately 11,983,340 acres are included in the forest reserves and closed to entry, and over two million acres are untaxed areas in Indian reservations. Government lands, unreserved and unappropriated and therefore subject to entry, amounted to 1,177,801 acres July 1, 1919, and state school and granted lands amounted to 1,803,179.52 acres March 1, 1920.

Of the state lands, over a million acres are subject to purchase by making application to the Commissioner of Public Lands, Olympia, Washington, who is authorized to appraise and advertise any piece for which application to purchase has been made, and sell at auction for 10 per cent down, 10 per cent annually and 6 per cent interest. At the discretion of the State Board of Land Commissioners, and subject to certain improve-

ments to be made by the purchaser, any granted lands of the state in tracts not to exceed 80 acres may be sold on a 20-year plan: 1/20 at date of sale, 1/20 the eleventh year afterwards, and 1/10 annually thereafter until paid, with interest on deferred payments at 4 per cent for the first 10 years and 6 per cent thereafter. Some 40-acre tracts have been already sold on this plan, with the provision that at least an acre shall be cleared each year.

The best of the unreserved and unappropriated government lands have already been filed on, but a few pieces suitable for grazing are still found. The amounts remaining are noted in the description of each individual county. The United States land offices to which one should apply for such lands are located at Seattle, Vancouver, Spokane, Waterville, Yakima and Walla Walla.

PRIVATE LANDS.

Some of the best opportunities for acquiring farms or garden tracts consist in purchasing privately owned lands from those who perhaps have more than they can handle to advantage or desire to hold indefinitely, and so are willing to dispose of portions at very reasonable prices. In Western and Northeastern Washington considerable is held by big logging companies who originally secured it for the timber and are now willing to sell the logged-off portions at low prices and in many cases render financial assistance.

In Eastern Washington there are also areas of irrigable lands in the valleys and dry farming or grain lands at the higher altitudes. Some of this is deceased-Indian land which is sold at auction by the Indian agent. The completion of a number of important irrigation projects already under way will soon add considerable area to that now available for irrigation purposes. One of these is the reclamation of Brewster Flats, one of the units of the Methow-Okanogan project in Okanogan county, under the supervision of the State Reclamation Board for the benefit of residents and new settlers.

By far the largest project is that known as the Columbia Basin Project which contemplates the watering of nearly 2,000,000 acres of choice lands in the Big Bend and Palouse with water from the Pend Oreille river. The survey for this

was authorized by the 1919 legislature and it has been proved very feasible.

There is also land in all parts of the state suitable for grazing and stock raising only. Not more than one-sixth of the state is at present improved, but much of the balance holds excellent possibilities for agriculture in one form or another.

IRRIGATION.

Over 500,000 acres are at present under irrigation in the state and proving the extraordinary fertility of the soil. All but a few acres near Yelm in Thurston county and around Sequim in Clallam county are in Eastern Washington. About half of the whole is in the valleys of the Yakima where several big government projects have been developed and are now being extended. Most of the remainder is found in the Wenatchee and Okanogan valleys and tributary territory, in the vicinity of Spokane, and in the Walla Walla valley. The rest is scattered along small streams or springs or near lakes and wherever pumping is feasible, including the Snake and Columbia river regions.

Where irrigation is practiced all crops common to a temperate zone and some semi-tropical vegetation grow abundantly and reach the highest perfection. Among the most important commercially are apples, peaches, pears, apricots, alfalfa, hops, berries, corn, and vegetables.

PRICES OF LAND.

Prices of land are discussed in connection with each county. But even there only general figures can be given since so many conditions affect the value per acre of every piece, among which are physical characteristics, location, and improvements. Wherever rough lands alone are considered they can be grouped as to prices to a certain degree, but where improvements are included their nature and extent and the acreage going with them have much to do with the price per acre.

In acquiring land one should not necessarily look for the so-called cheapest buys. Since so much depends on what the land will raise, the extent of improvements and its desirability as a place for a home, one will often be better satisfied with land that may cost a little more at the outset; that which seems

to be the cheapest is in many instances the most expensive, if all points are taken into consideration.

It is seldom good business, too, to buy land without seeing it. Ever so careless an examination may prevent one from investing in real estate that is not satisfactory for the purpose intended or for which too large a price is asked.

LUMBER.

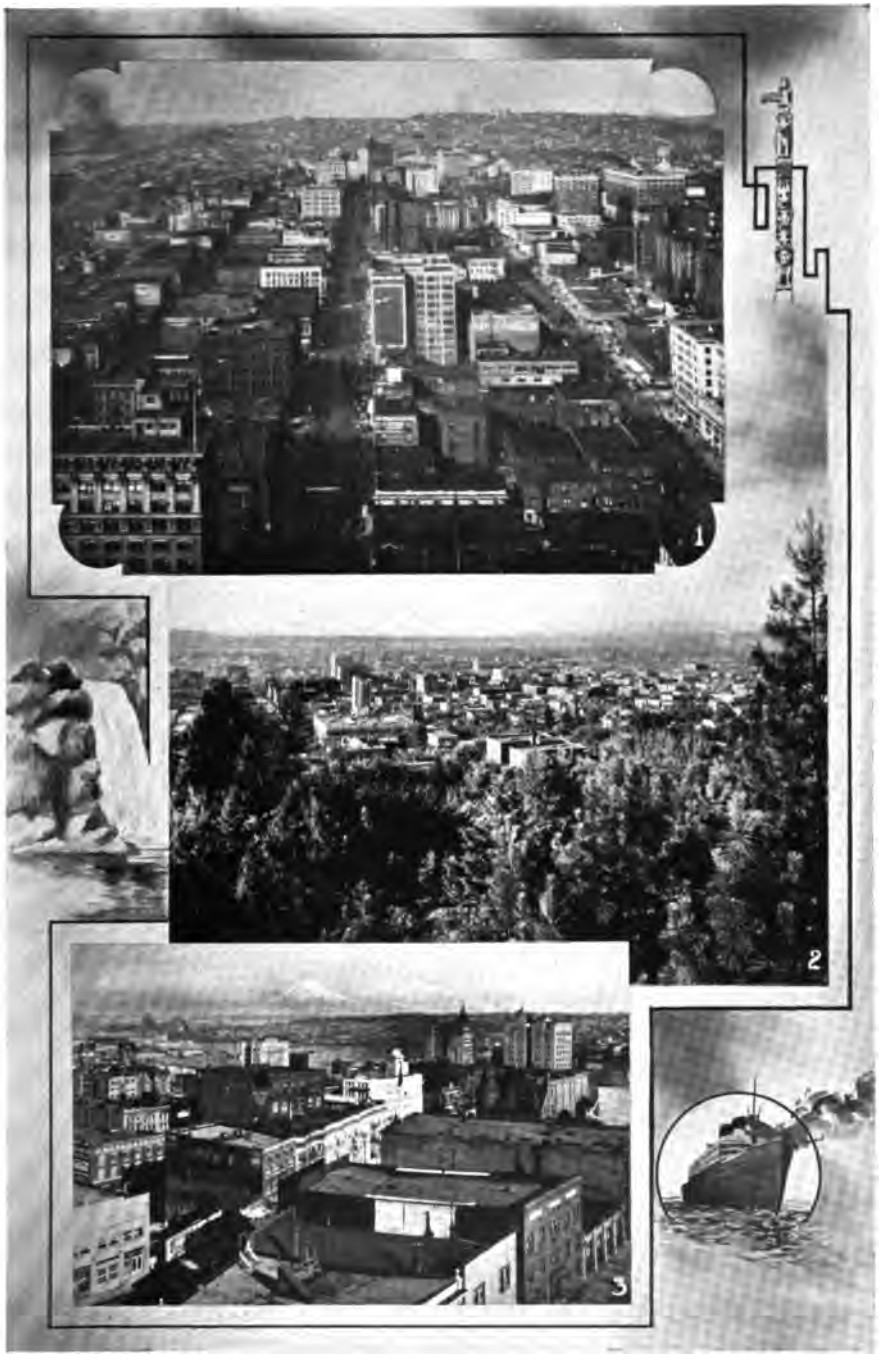
For the past fifteen years the State of Washington has held the first place in the Union in lumber manufacturing, and during the world war was the principal producer of the spruce used in the airplanes of our own and allied countries. The average yearly output is between four and five billion board feet and represents in value about 35 per cent of all manufacturing for the state. Washington also produces between six and seven million thousand of shingles, or two-thirds of all for the entire United States. This vast output requires about 300 lumber mills and over 200 shingle mills, including some of the largest in the world.

The body of timber yet remaining is greater than in any other state except Oregon. It is located chiefly on the ten million acres of reserves and the four and a half million acres of private timber lands, but considerable still stands on state lands. The total is enough to sustain the industry for decades to come. In the meantime reforestation is receiving some attention, and a substantial growth of the younger trees partially makes up for the amount cut each year. The principal trees are fir, cedar, hemlock, spruce and yellow pine, with some tamarack in the northeast counties.

By far the largest portion of the standing timber is in Western Washington and especially on the western slopes of the Cascade Mountains, on the Olympic Peninsula and on the Coast range in Pacific and Lewis counties. The sections of Eastern Washington containing timber are the Okanogan Highlands, the northern part of Spokane county, that portion of the southeast occupied by the Blue Mountains, and the eastern slopes of the Cascades.

FISHERIES.

The fishing industry of the state is confined chiefly to Puget Sound, Grays and Willapa harbors, the Columbia river and the



GLIMPSES OF OUR LARGEST CITIES.

(1) Seattle from tower of 42-story Smith Building. (2) Spokane from Rocky Point. (3) Tacoma from the Y. M. C. A. Building.

A FARM WHERE MOUNTAIN SCENERY BLENDING WITH PICTURESQUE VALLEY INSPIRES THE NOBLEST EFFORT.

Straits, but the operations of several large companies extend as far as Alaska. First in importance is salmon, which amounts to about 90 per cent of the whole. The rest is made up of crabs, clams, oysters, shrimps and miscellaneous varieties. Cod, halibut, mackerel and herring caught off the coast of Washington and Alaska also give employment to many men. Considerable oil fertilizer and glue are made as side products. The whole fisheries output during normal times amounts to between $10,000,000 and $20,000,000 annually, the wide difference being caused chiefly by the fluctuation of prices and difference in the size of the salmon run from year to year. In 1917, an exceptional year for prices, the total value was $22,654,688. During the past 30 years the value of salmon taken from the waters of the State of Washington has amounted to between $200,000,000 and $300,000,000. The salmon is canned and shipped to all parts of the world.

In order to encourage the fishing industry both state and Federal governments maintain hatcheries in the rivers and lakes and millions of fry are planted annually.

MINING.

The total mineral output of the state amounts to between fifteen and twenty million dollars annually. The non-metallic minerals have thus far been the greatest contributors and coal the greatest of all. Other important non-metallic minerals from a commercial standpoint are clay, building stone, sand and gravel.

COAL STATISTICS FOR 1918 AND 1919.

	1918	1919
Number of mines and openings of all kinds	72	71
Total production of coal (short tons)	4,128,424	3,059,580
Total value of coal at mines	$14,564,445	$10,997,733
Total production of coke (short tons)	144,349	65,332
Total value of coke	$1,295,258	$565,356
Total number of employees at mines	5,847	5,005

Of the metal minerals, gold, silver, copper and lead are the principal products and together amount to about a million dollars annually. Most of the gold and silver comes from Ferry and Whatcom counties. Copper comes from Ferry, Okanogan, Snohomish and Stevens. Lead and zinc are from Pend Oreille

and Stevens counties. There are also large deposits of iron ore and other valuable minerals in the Cascade Mountains and in the Puget Sound Basin but thus far they have received little attention.

WATER POWER.

Washington stands first in the Union in the quantity of potential water power available. According to the United States Geological Survey, about 16 per cent of the maximum potential water power in the United States is in the State of Washington, which means that with proper storage facilities and equipment about 9,500,000 horsepower can some time be developed. Thus far 361,000 horsepower has been developed and used to run street cars, for lighting purposes and general commercial purposes. Just recently the Chicago, Milwaukee & St. Paul Railroad Company electrified part of its road through the mountains with power from the big hydro-electric plants now in operation. The entire line is to be electrified as soon as the changes can be made.

It cannot be disputed that this vast potential power is one of Washington's greatest assets and will some day give it untold advantages in supplying its citizens with cheap power, light and heat, and in many ways that today are scarcely dreamt of.

MANUFACTURES.

Manufacturing has kept pace with the development of water power but will undoubtedly make greater advances in the future. In 1907 all manufactures amounted to $220,746,000, and represented a capital of $222,261,000. In 1914, it had increased to $245,326,000, with a capitalization of $277,715,000. Still larger increases have taken place since, but exact figures are not yet available. With the vast undeveloped water power, large beds of coal and unlimited raw materials of many varieties, it is difficult to forecast what the final possibilities may be. Manufactures representing the largest investments, other than timber products and their remanufactures, include flour and grist mill products; slaughter house products; canned or preserved fruits, vegetables, meats, fish, etc.; fruit juices; condensed milk, butter and cheese; beet sugar; cement and clay products; foundry and machine shop products; and printing and binding.

SHIP BUILDING.

Ship building has been steadily increasing in importance for many years, but when the European war broke out, the industry forged immediately to the front and soon became the leading and most serious business of the state and ranked it among the first in the Union in this respect. Since the Armistice the industry has dropped off considerably, but many yards are still engaged in the construction of steel and wooden vessels.

Washington is ideal for the industry on account of the numerous sites on the salt water, rivers and lakes, the possession of the proper raw materials, splendid transportation facilities and the ever increasing population of skilled workers. For wooden ships the superiority of Washington fir is well known on account of its great strength and the length of clear timber that can be cut. The industry is carried on in the Puget Sound district, on Grays Harbor and Willapa Bay, and along the Columbia river.

COMMERCE AND FINANCE.

An already large foreign trade is rapidly increasing from year to year. In 1914 the total value of all foreign business passing through the Washington customs district amounted to 110.4 million dollars, but in 1919 it had grown to the enormous figure of 588.6 million dollars, including 256.1 million for exports.

The principal trading countries include Japan, China, Siberia, the East Indies, Central South America, and the Dominion of Canada; but much business was also carried on with the Straits Settlements, Persia, India, Java, Egypt, Africa, Australia, New Zealand, England, Norway, Sweden, France, Spain, Italy, Belgium, The Netherlands and Mexico.

Washington's waterfront cities are the nearest on the coast to Vladivostok, and Puget Sound cities are the nearest on deep water by rail to New York. This advantage will be felt more and more as the trade of foreign countries with the United States increases.

The financial affairs of the state are carried on by 286 state banks, 84 national banks and 9 trust companies. Between November 1, 1918, and November 17, 1919, the deposits of these banks showed an increase of 25 per cent and the total bank

resources an increase of 13 per cent. The total deposits for November 17, 1919, amounted to $445,947,390, and the total bank resources to $513,767,548.57. The assessed valuation of all taxable property in the state for 1919 was $1,060,620,838 and the actual value $2,535,504,949.

TRANSPORTATION.

Transportation has made great strides. Steam and electric trains, boats and stages are all important transportation factors. Of steam trackage the Northern Pacific maintains 2,966 miles, the Great Northern 1,798 miles, the Chicago, Milwaukee & St. Paul 1,138 miles, the Oregon-Washington Railroad and Navigation Company, or Union Pacific, 1,133 miles, and the Spokane, Portland & Seattle 512.41 miles. A number of less important lines, including both passenger and logging roads, bring the total for the state up to 7,579 miles. Other companies mentioned in connection with the county and city descriptions operate over these tracks.

Electric interurbans operate from the largest centers to the neighboring towns and about 1,000 miles are at present in use.

Since the state has many perfect harbors, distributed along its 2,500 miles of salt water frontage, over 1,000 miles of navigable river and several large lakes, steamboat transportation facilities have been increased to a remarkable degree. Many of the communities have created port districts and are improving the natural advantages to the utmost. River and sound steamers operate between the local points and great ocean liners carry on coast commerce and sail for all parts of the world.

HIGHWAYS.

The state is well provided with highways which lead to every little village and hamlet and farm house, and into the most wonderful scenic spots of nature. These are all connected up with arterial highways which join all the leading cities of the state and become links in national or interstate thoroughfares. At present over 40,000 miles of state and county highway are maintained, much of which is paved with cement, brick, or other hard surfacing material. To further this work it is planned to spend the money derived from the issuance of motor vehicle licenses, which already amounts to nearly $3,000,000 annually.

Among the most important primary state roads established are the Pacific Highway from Vancouver to Blaine, the Sunset Highway from Puget Sound over the mountains to Spokane, the Olympic Highway around the Olympic Peninsula, the National Park Highway from Puget Sound to Rainier National Park and Willapa Harbor, the Inland Empire Highway from Yakima to Walla Walla and Spokane, and the North Bank Road along the Columbia river.

These state highways are all of permanent and easy grades and at present hard surfaced most of the way. They are so routed as to tap the most resourceful sections of the state and at the same time introduce the motorist to some of the most thrilling nature scenes of the Pacific Northwest.

EDUCATION.

For years Washington has ranked among the highest educationally in the Union. A few years ago it was given first place by the Russell Sage Foundation, and the same standards then attained have been rigidly adhered to. No expense is spared to give every child in the state, no matter how remote the district in which he lives, the same educational advantages as every other. The large and ever increasing permanent school fund derived chiefly from the sale of school lands, besides the laws by which the state and every county and school district may tax itself for such purposes, insures a continuation of a high standard of instruction.

By the consolidation system, grade and high schools are within reach of all. For the year ending June 30, 1919, 272,325 pupils were enrolled, the average daily attendance was 197,595, and the number of teachers employed 9,770. The total enrolled in high schools was 37,317 and the number of teachers 1,612.

For higher education, four state normals are maintained, a State University, a State Agricultural College and numerous private academies and colleges, including such well known institutions as Whitman College, Whitworth College, Gonzaga University, the College of Puget Sound, Vashon College, and Colfax College.

STATE GOVERNMENT AND INSTITUTIONS.

The affairs of the state are administered by eight elective state officers, including a governor, secretary of state, auditor, treasurer, attorney general, superintendent of public instruction,

land commissioner, and insurance commissioner. A lieutenant governor is elected to act when the governor is incapacitated and to preside over the senate. The legislative department consists of 97 representatives and 42 senators chosen by their respective districts. The judiciary consists of nine supreme court judges and 60 superior court judges, elected on a judicial ballot. Each of the 39 counties and the 200 incorporated cities have separate government organizations for local matters. Equal suffrage, initiative and referendum, the recall, and strict prohibition have been in effect for many years.

Important state commissions touching the everyday life of the people include an industrial insurance commission, a public service commission, a welfare commission, a department of weights and measures, and many others. A state agriculture department with experts in all lines is maintained for the help of farmers, and most of the counties have availed themselves of the law authorizing the employment of special county agricultural experts. Experiment stations are maintained at Pullman in Eastern Washington and at Puyallup in Western Washington, while smaller ones are maintained at Lind, Waterville and Prosser, all in connection with the work of the State Agricultural College. In the meantime a state reclamation board is busy planning for the development of the vast areas of irrigable, logged-off and swamp lands yet remaining.

Among important institutions other than educational maintained at state expense are a boys' training school, a girls' training school, a school for the deaf and another for the blind, a state soldiers' home, a veteran soldiers' home, a school for feeble-minded children, three hospitals for the insane, a reformatory and a state penitentiary.

ENCOURAGEMENT OFFERED.

Finally, it may be said that the people of Washington are justly proud of their state, its natural endowments, its institutions and its achievements. But the vastness of its undeveloped resources, the possibilities for future growth and the unusual opportunities for human success are fully realized. It is for this reason that the invitation is extended to the ambitious, the intelligent and the energetic to come and apply their talents, where every encouragement is offered and where contentment and material progress reward well directed effort.

THE STATE BY COUNTIES.

Puget Sound Group.

WHATCOM COUNTY.

This is the extreme northwestern county in the United States. It is bounded on the north by British Columbia, and on the west by the Strait of Georgia and Bellingham Bay.

Natural Features: Rising suddenly from the Sound on the west, an expansive level to gently rolling plain of from 300 to 400 feet elevation, extends to the foothills of the Cascades in the east and to the rolling to hilly plateau in the south. Through this area flows the Nooksack and its tributaries. The main stream circling through the northern sections finally carries the accumulated drainage of the county into Bellingham Bay, leaving along its banks extensive areas of rich level bottom lands, which gradually rise to the altitude of the adjoining cut-over uplands. A number of pretty lakes dot the surface, the largest of which are Lakes Whatcom and Padden, both adjacent to Bellingham and affording many recreative features. Several islands, the largest of which is Lummi, are included in the land area of the county.

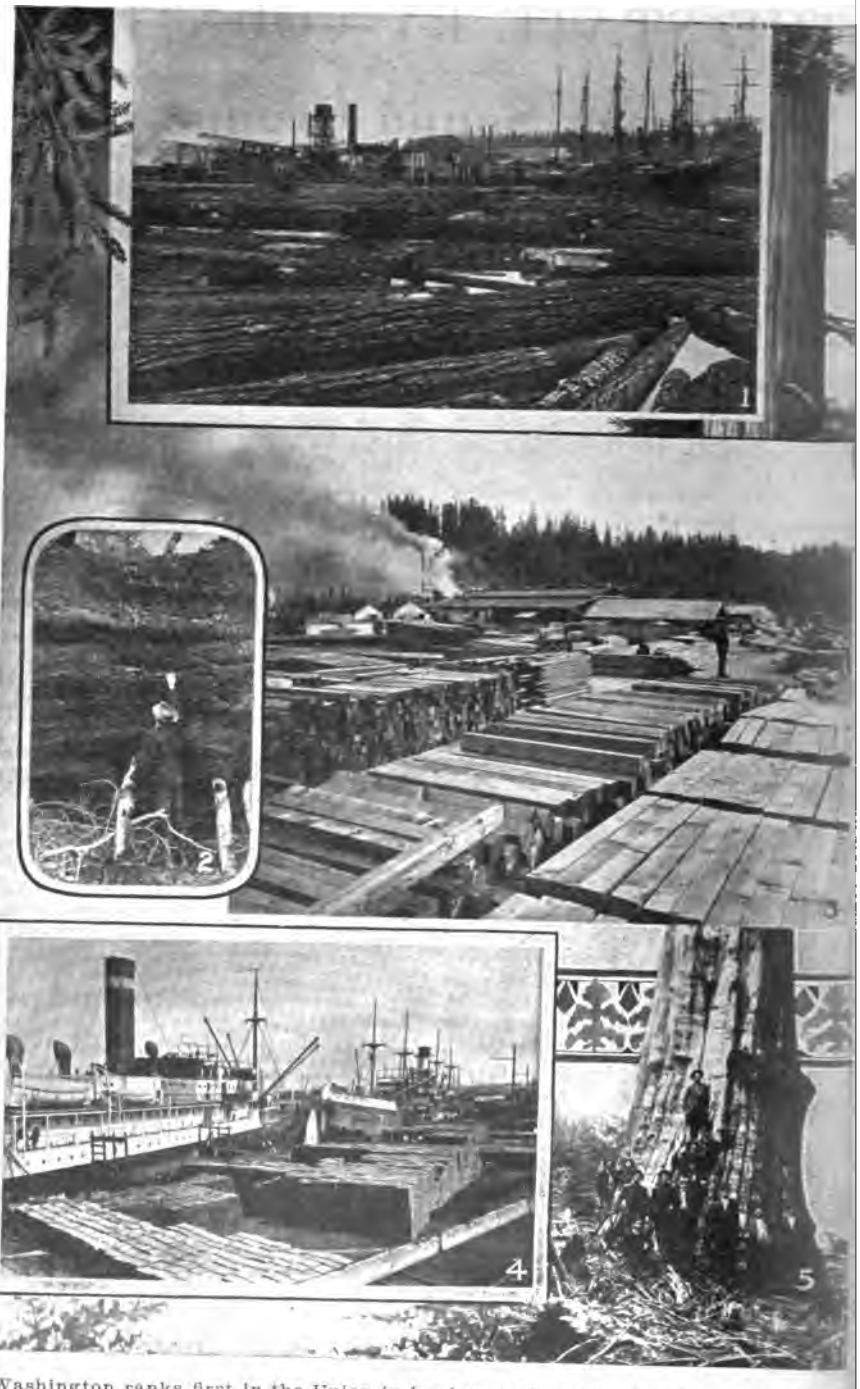
The mountainous country toward the east, which comprises about 70 per cent of the county, is still heavily timbered and is included in the Washington National Forest Reserve. Its highest peak is Mount Baker, 10,827 feet high and the goal of many a band of tourist adventurers.

Soil: The soils of this county are composed generally of a high percentage of silt, a fair amount of clay, and sand of varying fineness in larger or smaller quantities. In a few sections a large percentage of gravel is evident. Much of the valley land is alder bottom, consisting of sandy, slightly calcareous loam, while the uplands reveal a preponderance of clay loams. There is also some so-called peat and muck, tidal swamp, and marsh lands, considerable of which is suitable for cranberry culture. Practically all the territory between the foothills and the Sound is agricultural and nearly all classes of soil seem well supplied with organic matter, which with proper moisture and subsoil is unsurpassed in productiveness. Berries, fruits, hay and oats are profitable crops in most places and dairying is everywhere very successful.

Climate: The fact that the county is the most northern should not presuppose a rigorous climate. The reverse is the case, due to the warm moisture bearing wind from the Pacific and the protection afforded by the neighboring mountainous regions. The mean monthly temperature at Bellingham varies from 35.2 for January to 60.7 degrees for July. The mean minimum in January is 32.6 degrees and the mean maximum in July is 71.4 degrees. Precipitation throughout the western area is from 30 to 42 inches. Growing season is from 153 to 177 days.

Population: The 1910 census listed a population of 49,511, about half of which was in the city of Bellingham and the rest in the towns and farming communities west of the forest reserve. The 1920 census recorded a total of 50,585, but the tendency is toward a more rapid growth in the future. Nearly every nationality is represented, including a few Japanese and Chinese; the latter make good cannery hands. Of particular interest is a strong colony of Hollanders, successfully engaged in dairying near Lynden. Scandinavians are conspicuous in the timber industries.

Lands: The entire land area of the county is 1,332,480 acres, of which 839,851 acres, or 63 per cent, are included in the Washington National Forest Reserve, 23,953 acres are state school and granted lands, 12,561 acres are in the Lummi Indian Reservation, and less than 3,000 acres of rough land remain unappropriated and unreserved for homesteaders. The county assessor reports about 95,000 acres of privately owned timber, about 63,000 acres under cultivation and 253,000 acres of other unimproved private



Washington ranks first in the Union in lumber production and makes two-thirds of all cedar shingles produced in the United States.
1—A sawmill in action. 2—A cross-section of a fir. 3—A lumber yard.
4—Shipping shingles. 5—A cedar stump.

lands. Of this latter, about 100,000 acres will be suitable for intensive improvement when cleared and the remainder good for stock raising and dairying enterprises.

Prices of Land: Prices for improved river valley areas will run from $150 to $300 per acre. Improved bench lands sell for $100 to $150, and wild or partially slashed stump lands can be had for from $25 to $75. Grazing land is worth from $10 to $25. In the foothills and rough sections there are still offerings at $10 to $25, suitable for grazing.

Resources and Industries: Fisheries, timber, agriculture, mines, water power, manufacturing and commerce will each always play an important part in this county's growth and prosperity. Most prominent of all is the lumber industry and practically every city and town has one or more lumber and shingle mills. In the city of Bellingham alone, it is estimated that 260,000,000 feet were cut in 1919. The large remaining acreage of timber lands with reforestation methods employed should permit these industries to last an interminable period. On the privately owned lands alone the county assessor estimates that nearly three and a half billion feet yet remain, segregated as follows:

Fir	1,575,685,000
Pine	12,375,000
Cedar	716,180,000
Spruce	16,935,000
Hemlock	760,025,000
Larch	242,530,000

The most important fisheries in the state center in this district. The output of salmon will run well into the millions each year. Bellingham and Blaine are the principal cities in this regard.

Of agricultural pursuits, dairying, poultry raising, horticulture, floriculture and seed production are carried on to a large extent. There are two condenseries, six creameries, and one cheese factory. Only two counties, Snohomish and King, have more cows, or a greater amount of poultry, the number of milch cows in 1919 being over 15,000. Horticulture is represented by about 40,000 apple trees, 8,000 pear trees, 8,300 cherry trees and 6,000 plum and prune trees. The government bulb farm just out of Bellingham is proving the climate and soil ideal for bulbs. Flax growing too has been found very successful.

The principal mineral products are coal, gold, and cement materials; but other minerals exist, including silver, clay, marble and sandstone. The annual coal output in this part up to a year ago was between 5,000 and 6,000 tons, but the uncovering of new properties, one within the city limits of Bellingham, is now increasing this figure many fold. This one mine is yielding between 400 and 500 tons a day. The annual production of gold amounts to $150,000 and considerable activity is taking place for its further development.

Manufacturing consists principally of lumber and wood products, cement, ship building, fish canneries, dairy products and other food preserving plants, all mentioned in connection with the cities and towns following.

Transportation and Highways: The county enjoys about 187 miles of steam railroad, 35 miles of electric railway and over 600 miles of highway, practically all confined to the western third of the county. The Great Northern, operating between Vancouver, B. C., and Seattle, serves most of the towns and cities nearest the coast. The Northern Pacific enters the county at Wickersham and runs to Sumas, with connections for Bellingham and Vancouver. The Milwaukee operates from Bellingham to the coal fields of Mt. Baker. Bellingham and the territory to the south as far as Mt. Vernon, is served by an electric line which is projected north and east.

The highways are the pride of the county. Fifty-four miles of paved roads radiate from Bellingham, including the Pacific Highway to Blaine and the international boundary line. The extensions are all hard-surfaced and satisfactory the year round. Stages and trucks serve every town of consequence in the county. Steamers ply between the county ports and all points on the Sound, while California and Alaska freight and passenger boats make regular calls. The products of forest, factory, cannery and farm are shipped to all parts of the world.

Social Conditions: Social and educational progress is evident. Grade schools are located in every little village and high schools at convenient centers. At present there are 71

school districts, 22 high schools and six private schools in the county, in addition to one of the state normals. Churches of all denominations are supported, fraternities are well represented, and women's clubs exist in the largest places. Mail is distributed by 25 postoffices and 17 rural routes. Altogether 16,238 miles of telephone wire and 255 miles of telegraph wire are maintained. Thousands of tourists come here from all parts of the United States.

CITIES AND TOWNS.

Acme: Elevation 311 feet. A town of several hundred people, located on the south fork of the Nooksack river, in a rich dairying district on a paved road leading to Bellingham 12 miles west. Lumber and shingle manufacturing are also carried on. It is served by the Northern Pacific railway and by several stages daily to Bellingham. A newspaper, two churches, a high school and the necessary community enterprises are supported.

Bellingham: County seat. Altitude, sea level to 110 feet. Population, 1910 census, 24,298; 1920 census, 25,570. Incorporated area 207 square miles. This city is the metropolis of Whatcom county and considerable other tributary territory which it serves as a jobbing and trading center. It is ideally located on Bellingham Bay, an expansive body of water, unsurpassed for commercial advantages and scenic surroundings. Extensive wharfage facilities, including a new municipal dock just completed, accommodate many Sound steamers and others leaving for coast and foreign parts. It enjoys unusual railway advantages, being served by the Northern Pacific, Great Northern, Chicago, Milwaukee & St. Paul and Canadian Pacific transcontinental trains as well as an electric line to Skagit county cities. It is the leading center in the northwest for the salmon canning industry, which is carried on by five large canning establishments, one of them the largest in the world. It is also prominent in lumber and shingle manufacturing, having three large mills operating on its salt water frontage, besides others in adjacent territory. The city is unique in being underlaid with an immense bed of coal which is now being mined within the city limits, over 400 tons per day being taken out.

Other important industries include a modern Portland Cement plant with a 2,000 barrel daily capacity, a fruit product factory with a capacity of 100 cars a year, various woodworking plants, fruit canneries, tile and brick works, and boiler works. Among its war enterprises was the building of 13 large cargo vessels and the cutting of much spruce for the government. Total manufacturing in 1918 amounted to about $12,000,000.00.

Its public institutions include one of the three state normal schools, two large high schools, 13 grade buildings, 50 churches, a modern Y. M. C. A., two Carnegie libraries and a modern federal building. There are also two parochial schools, three business colleges, two private schools of music and art, three daily newspapers, two weeklies and one monthly. Nearly every fraternal organization is represented.

The city also has 47 miles of paved streets, 103 miles of paved walks, 73 miles of sewer, 30 miles of street railway, a million dollar gravity water system, arc lights, three paid fire departments, and four parks with a total area of 145 acres. Its five banks have deposits of over $10,000,000 and the actual valuation of all taxable property is about $30,000,000.

Blaine: Altitude, sea level to 4[illegible] feet. Population, 1920 census, 2,254. A growing city situated near the British Columbia boundary line on Drayton harbor. It is the most northwesterly municipality in continental United States, which favorable geographical position makes it a port of entry. Nearly all basic resources contribute to its support, especially fish and timber. There are several large salmon canneries, a number of shingle mills, big saw and box factory, a lacquer factory, two machine shops, a fertilizer plant, a can factory, and a creamery, altogether employing close to a thousand men in season. There is much farm area in the vicinity excellent for dairying and extensive farming, and a large area is devoted to the cultivation of oysters.

City has a bank, a four-year high school, seven churches, two weekly papers, public library, public park, paved business streets, a good water

system and electric lights and fire department. New manufacturing enterprises are encouraged. Transportation is by Great Northern trains, daily steamers, and auto stages.

Custer: Elevation 32 feet. A town of about 200 people, located on the Great Northern railway, 15 miles northwest of Bellingham. It has lumber and shingle mills, a creamery and various miscellaneous industries, also a bank and good school and church facilities. Surrounding logged-off lands are excellent for general farming and dairying. Considerable cranberry bog lies nearby and the growing of seed peas has been found profitable.

Everson: Altitude 84 feet. Estimated population 350. An important dairying center in the Nooksack valley on the Bellingham Northern railway, 16 miles northeast of Bellingham. A large condensery and a fruit and vegetable cannery are located here. Manufactures amount to over a million dollars annually. A bank, church, high school and weekly newspaper are supported. Frequent stages run to Bellingham.

Ferndale: Altitude 25 feet. Population 1910, 691. Census of 1920, 759. City is located on the Nooksack river, 10 miles northwest of Bellingham. Several saw and shingle mills are in vicinity but the chief sustaining industries in the future will be farming, fruit culture, and dairying. A condensery, creamery and fruit cannery are maintained. It has a bank, four-year high school, weekly newspaper, three garages, five general stores, seven churches, five fraternities, paved business streets and sidewalks, good water system and volunteer fire department. Principal roads leading to it are paved. Transportation is by Great Northern trains, and stages to Bellingham every half hour.

Glacier: Located in the Washington National Forest at the terminus of the Bellingham Northern railway. It is the outfitting point for the Mt. Baker mining district, and one of the starting points for tourists visiting the mountain and other lesser points. Large coal deposits are supposed to exist.

Lawrence: A shingle mill village of about 100 people, 13 miles northeast of Bellingham in the Nooksack valley. Transportation is by Northern Pacific trains and stage.

Lynden: Altitude 95 feet. Population 1910, 1,148; 1920 census, 1,244. The city is picturesquely situated in the center of a rich farming section of the Nooksack valley, 16 miles north of Bellingham, and is locally known as the "Gem" city of the interior country. It is essentially a dairying center, with a large creamery in the city and many splendid dairy farms adjacent. It also has several saw and shingle mills, with auxiliary enterprises. All manufactures amount to about a million dollars annually. It has a bank, newspaper, five churches, a four-year high school, a parochial school, municipal water works, volunteer fire department and paved streets. Walks are lined with old maple trees. Business buildings are all substantially built. Transportation is by Chicago, Milwaukee & St. Paul trains and auto stages.

Maple Falls: Altitude 665 feet. A town of about 300 population, 37 miles northeast of Bellingham, devoted to the manufacturing of lumber and shingles, with about 100 men employed. A four-year high school, church and newspaper are supported. Transportation is supplied by Bellingham Northern railway and stages.

Nooksack: Altitude 94 feet. Population 1920, 283. A farming center, three miles from Everson on the N. P. Ry. Milk is shipped to condensery at Everson. Berry growing and general farming are also successful. It has two churches, high school, weekly paper and electric lights.

Sumas: Altitude 48 feet. Population 1920, 854. An important railroad town on the British Columbia boundary line. It is the junction point and customs port of the Northern Pacific, the Canadian Pacific, and the Bellingham Northern railways; also a supply point for a large area of rich farming and fruit land located within the county and additional just across the border. Several saw and shingle mills operate in the community and one of the largest pear and berry orchards in the West is about one mile from town. A great bed of fire clay of high quality also awaits development. It has a four-year high school, two grade schools, paved business streets,

good water supply, electric lights, telephone exchange, a public library and two newspapers.

Wickersham: A town of about 300 population, 22 miles southeast of Bellingham and 12 miles north of Sedro Woolley on the Samish river and Northern Pacific railway. Shingle and lumber manufacturing are main pursuits, but logged-off lands are being gradually cleared and dairying is increasing in importance. Stages run to neighboring towns and Bellingham.

SKAGIT COUNTY.

In general topography, climatic conditions, products, and means of transportation this county resembles Whatcom on the north and Snohomish on the south. Interested inquirers should read the descriptions of all three counties.

Natural Features: The east half is very mountainous and heavily timbered, for the summits of the Cascades mark the eastern boundary line. Many swift mountain streams, however, have carved their way through the mountain barriers and joined the Skagit river, which, flowing a distance of 135 miles from its source in British Columbia, bisects the western half of the county and finally empties its turbid waters through a number of different channels into the Sound, bounding the county on the west. The Skagit valley comprises large areas of very rich agricultural land, broadening out near the salt water and blending with the rich, extensive delta lands known as the Skagit, Olympic and Samish flats. A number of islands are also included in the county's limits, chief of which are Guemes, Cypress, Sinclair, and Fidalgo, the last named being connected with the mainland by rail and highway.

Population: The growth in this section has continued at a fair rate since 1910 when the census figures showed a total population of 29,241, an increase of 14,272, or 104.9 per cent over that of 1900. The 1920 census recorded 33,388, an increase of 14.2%. Of the foreign nationalities, Scandinavians predominate, but nearly all others are represented.

Climate: The climate of the valleys is mild and equable, resembling North Carolina and Georgia, but with fewer degrees of variation. The winter months, December, January and February, average 38 above, and the mean monthly temperature for July and August is about 62 degrees. The mean annual precipitation is 28.12 inches at Anacortes, 46.40 inches at Sedro Woolley, and 64.55 inches at Baker, near Marblemount. Growing season is from 170 to 208 days.

Soils: Various phases of silty clay, silt loam and sandy loam, intermingled with occasional peat and muck, comprise the lower areas. They are all deep soils, level in topography and rich in decomposed vegetable matter. The uplands are principally a gravelly sandy loam derived from the weathering of glacial drift. The low flat lands are probably unexcelled in productiveness; 100 bushels of oats to an acre is common and some tracts have been known to yield as high as 187 bushels; timothy, clover and vetches also yield exorbitant crops and all kinds of vegetable seeds are grown to advantage. The rolling uplands will yield good crops of fruits, berries, potatoes and grass.

Lands: The total land area amounts to 1,135,360 acres, of which 471,651 acres are included in the forest reserve, 3,420 acres are unreserved government lands, 37,842 acres are state holdings, and 7,359 comprise the Swinomish Indian Reservation. This leaves over 500,000 acres in private ownership, about 225,000 acres of which are assessable timber lands and the remainder either logged-off or totally cleared agricultural area. Altogether about 67,000 acres are well improved but about 125,000 acres additional, of what is now logged-off, can be finally subjected to intensive farming. In its present state it is suitable for grazing. About 40,000 acres in the extreme western part of county are included in the rich diked lands already described.

Prices of Land: Unimproved bench lands suitable for agriculture can be bought for from $25 to $75 an acre.

but valley lands favorably located will go as high as $150. General farming lands, improved, range from $100 to $300. Best lands in the flats highly improved and very productive will cost, with buildings, from $200 to $800 per acre.

Resources and Industries: General farming and dairying stand out among the prominent industries of the county. The valleys and tide flat lands are unsurpassed in productiveness and the uplands are excellent for grasses and pasturage. Prodigious crops of oats, hay, vegetables and seeds are yielded. About $200,000 worth of seed, 2,000,000 bushels of oats, 45,000 tons of hay and 400,000 bushels of potatoes are among the annual crops. About 12,000 high grade milch cows are in the county, supporting three large condenseries and five creameries. The value of butter alone amounts to at least $700,000 annually. The progress made in horticulture is indicated by the presence of 60,000 apple trees and 33,000 of pear, cherry, plum and prune trees.

Lumbering is second in importance. Every little town has its sawmill and shingle mill together with the allied industries. Some of the thickest stands of timber to be found are in this county; about 12 billion feet remain on the private lands and four billion feet on school lands and in the Washington Forest Reserve. Fir, cedar, spruce, hemlock and larch predominate.

The salmon fishing industry is important at Anacortes where a number of very large canneries are maintained. Crabs and clams are produced in quantities and codfish are brought here to be cured and dried. The Skagit river is said to be the only river in the United States where Sockeye salmon spawn.

Mineral deposits include cement material, clay, coal, copper, gold, silver, iron, molybdenum, and sandstone. The unlimited limestone deposits support two large cement plants at Concrete. Coal and gold mining have been worked at for years, and quite recently valuable finds of copper, iron and molybdenum have been found.

Water: Unlimited quantities of the purest water are obtained from springs and creeks, or shallow wells about 10 to 30 feet in depth. Numerous beautiful lakes, well stocked with fish, are scattered through the valleys and on the mountain heights. Large quantities of water power are at present going to waste in the mountain streams, but several power plants, including the site for the city of Seattle, are in process of construction on the Skagit and Baker rivers.

Transportation and Highways: The Great Northern railway bisects the county both east and west and north and south; the Northern Pacific railway traverses it north and south; while the trolley system of the Pacific Traction Company connects the principal towns with Bellingham and will eventually extend to Everett. The total mileage of steam railroads is 173 and of electric lines 25. Steamships ply between Anacortes and other Sound ports and foreign vessels make frequent calls. The Skagit river is navigable for 30 miles. The county has 750 miles of good highway, most of which is very attractive to automobilists.

Markets: Markets for the huge oat and seed crops, the cement, and fish products, are found in all parts of the world, even as far as the Orient. British Columbia, Alaska and the Sound ports buy the surplus fruit, vegetable and other farm products. Logs, piling, and shingles are carried by train and steamship to domestic and foreign markets.

Social Conditions: The people are generally prosperous. Splendid grade and high schools are provided; public libraries and pretty churches are in nearly all the cities; good roads and public improvements are encouraged; and evidences of hospitable social life are everywhere apparent. One of the yearly attractions is the county fair, held each fall at the county grounds located midway between Mount Vernon and Burlington. Various associations and fraternities are supported in all the centers. Mail service is supplied by 30 postoffices and 12 rural routes. There are 76 school districts, 12 high schools and two private schools.

CITIES, TOWNS AND VILLAGES.

Alger: A logging and dairy center of about 200 population, located on the Pacific highway and a branch of the Great Northern railway, 15 miles south of Bellingham. Church and

school facilities, electric lights and piped water are provided.

Anacortes: Altitude, sea level. Population 1910, 4,168; 1920 census, 5,284. Total incorporated area about 12 square miles. Located on Fidalgo island, which is connected with the mainland by the Great Northern railway and a hard-surfaced scenic highway. It is the principal seaport of the county and has extensive wharfage facilities for deep water traffic, with terminal rates applying. Passenger steamers and freight vessels make regular calls. It is essentially a manufacturing city, the principal raw materials being derived from the forest, the fisheries, and agriculture. It has seven large salmon canneries which probably rank it first in this respect on the Pacific Coast. Other industries include two codfish plants, one fresh fish packery, two large shipyards, nine shingle mills, three sawmills, two cedar-siding factories, a box factory, three machine shops, two glue and fertilizer plants, a cold storage plant, two creameries, an ice plant, a glass factory (the only one in the West), and a number of other smaller plants. More than 30 manufacturing plants are now in operation and plans are being made for others. Total value of output amounts to about $3,500,000 annually and the payroll to about $100,000 monthly.

The city has seven churches, a modern four-year high school, several grade schools, a public library, and two newspapers; also three parks, a paid fire department, gravity water system, electric lights, four miles of paved street, and 20 miles of sidewalk. Plenty of factory sites with rail connections and deep water frontage are available.

Bay View: A town of about 200 people, located on Padilla bay, nine miles east of Anacortes and 12 miles northwest of Mt. Vernon. A large brick and tile plant, three general stores and a garage make up the principal business concerns.

Biglake: Altitude 95 feet. A town of about 400 people, located on the Northern Pacific railway, nine miles south of Sedro Woolley. Lumber and shingle manufacturing and the making of brick and tile are the leading pursuits. A union church, good school facilities and electric lights are enjoyed.

Birdsview: A pretty town, 23 miles east of Burlington, on the Rockport branch of the Great Northern railway. Farming and lumber manufacturing are the sustaining industries. Dairying conditions are ideal.

Blanchard: A town of about 300 population, located on the Great Northern railway, 12 miles south of Bellingham, at outer edge of Samish flats. Lumbering, shingle manufacturing and farming are carried on.

Burlington: Altitude 35 feet. Population 1910, 1,302. Census of 1920, 1,360. A railroad center, near the western extremity of county. The Great Northern main line and the Anacortes - Rockport branch cross here, the Sedro Woolley branch joins the main line of the Bellingham Electric and highways leading east and west join the Pacific highway at this point. The sustaining industries are shingle manufacturing, dairying, and fruit and poultry raising. It has a combined fruit and vegetable cannery, a creamery and cheese factory, two banks, weekly newspaper, two blacksmith shops, four garages, railway shops, and all lines of commercial businesses. It has seven churches, two four-year high schools, seven fraternities, electric lights, city park and volunteer fire department. County fair is held just south of city.

Clearlake: A lumber town, of about 700 people, prettily located between two lakes on the Northern Pacific railway, in a rich timber district, three miles south of Sedro Woolley. It has a large sawmill, bank, church, good school facilities and electric lights. Stages run to Sedro Woolley and Arlington.

Concrete: Altitude 194 feet. Population 1920, 924. Located at the junction of the Skagit and Baker rivers, 23 miles east of Sedro Woolley, and surrounded by fertile valley lands and snow-capped mountains. The principal industry is the manufacturing of cement by the Washington and the Superior Portland Cement companies, which together employ nearly 400 men and turn out about 5,000 barrels daily. A sawmill is also in operation. Much water power and mining possibilities are also in vicinity. City has three churches, four-year high school, newspapers, six fraternities, electric

lights, paved streets and good water supply.

Edison: A farming town of about 300 people, located on Samish bay in northwestern corner of county and served by stages and Bellingham electric cars. It has a shingle mill, bank, two churches, and a union high school.

Hamilton: Altitude 96 feet. Population 1910, 405; 1920 census, 896. An important lumber town on the Great Northern railway and the north bank of the Skagit river, 11 miles east of Sedro Woolley. It has a sawmill, cheese factory, bank, two churches, and a four year high school. In vicinity are large deposits of iron ore and coal, also much logged-off land suitable for farming.

La Conner: Population 1920, 516. This is the oldest town in the county. It is located at the mouth of the Skagit river on Skagit bay and is an export point for the oat fields and seed farms of the famous La Conner flats. In addition to steamboat transportation regular stages run to Mt. Vernon located on the Great Northern railway. It has a cannery, shingle mill, sawmill, bank and garage. Many men find employment in the fishing industry. Three churches, a four-year high school, and weekly paper are supported. Electric lights, gravity water system and a public park are maintained.

Lyman: Altitude 95 feet. Population 1920, 592. A lumber and shingle manufacturing town, located in the center of a dairying and stock raising section, eight miles east of Sedro Woolley. Splendid hunting and fishing grounds are tributary. It has a bank, two churches, a high school, park and electric lights.

McMurray: Population 1920, 243. Located on the Northern Pacific railway, near the southwest corner of county. It has a large sawmill and a shingle mill. Church and high school facilities are provided. Logged-off land and coal prospects are in vicinity. Stages run to Sedro Woolley and Arlington.

Mount Vernon: County seat. Altitude 24 feet. Population 1910, 2,381; 1920 census, 3,341. Prettily located on the navigable Skagit river and the Great Northern railway, about eight miles from the Sound and 69 miles north of Seattle. It is surrounded by some of the richest farming and dairying lands in the state, protected from river overflows by great dikes. Dairying is the principal sustaining industry, two large milk condenseries and a creamery being supported. Among other local businesses are three banks, a machine shop and several woodworking plants. A high school, four grade schools, 16 churches, and other public buildings are maintained. It has two newspapers, municipal water works, electric lights, telephone system, a volunteer fire department, and several miles of paved streets. It is also a terminus of an interurban electric system extending to Bellingham.

Prairie: A shingle mill town of about 200, located on the Northern Pacific railway, seven miles north of Sedro Woolley. Farming is also important. Church and high school facilities are maintained.

Rockport: A town of about 150 people at the junction of the Skagit and Sauk rivers and the terminus of the Great Northern branch.

Sedro Woolley: Altitude 50 feet. Population 1910, 2,129; 1920 census, 3,389. A railroad center located in the rich valley of the Skagit river, served by the Great Northern, Northern Pacific, and the Bellingham interurban railways. Tributary to it are rich level farming lands, timbered mountains, and mining possibilities. For industries, it has a large condensery, creamery, ice and cold storage plant, two machine shops, one foundry, several shingle mills, box and veneer plant, furniture factory, elevator and feed mill, vinegar factory, and a roundhouse. The city also has seven churches, a four-year high school, two grade schools, Carnegie public library, two newspapers, two banks, and the state's Northern Hospital for the Insane. It also has a volunteer fire department, gravity water system and electric lights. The development of surrounding country means much to the growth of this young vigorous city.

SAN JUAN COUNTY.

San Juan county consists of the group of 172 beautiful islands lying between the Strait of Juan de Fuca and the Gulf of Georgia. Some of these islands appear as tiny dots on the surface of the water and others are large enough to support a contented and thrifty population. The largest are Orcas with an area of 57.7 square miles, San Juan containing 54.7 square miles and Lopez of 40 square miles. These three comprise most of the land area of the county and support more than three-fourths of the population. Shaw, Waldron, Stuart, Blakely and Decatur also have prosperous communities and many of the others are inhabited.

No région in the world presents more entrancing loveliness than do these verdure-clad, deeply-indented, agate-beached gems of Puget Sound, and their historical associations add additional charm and interest, for on San Juan, the leading island and most populated of all, the British flag was seen floating for the last time as the emblem of English authority in what is now the United States of America. The neighboring waters seem also to have been chosen as the playgrounds for the salmon, myriads of which throng and sport through the deep passages just before making for the spawning grounds in the mainland rivers.

Wealthy men from the cities have already selected many of the quiet picturesque coves for their summer homes and have improved them by adding the comforts and conveniences desired during retiring life.

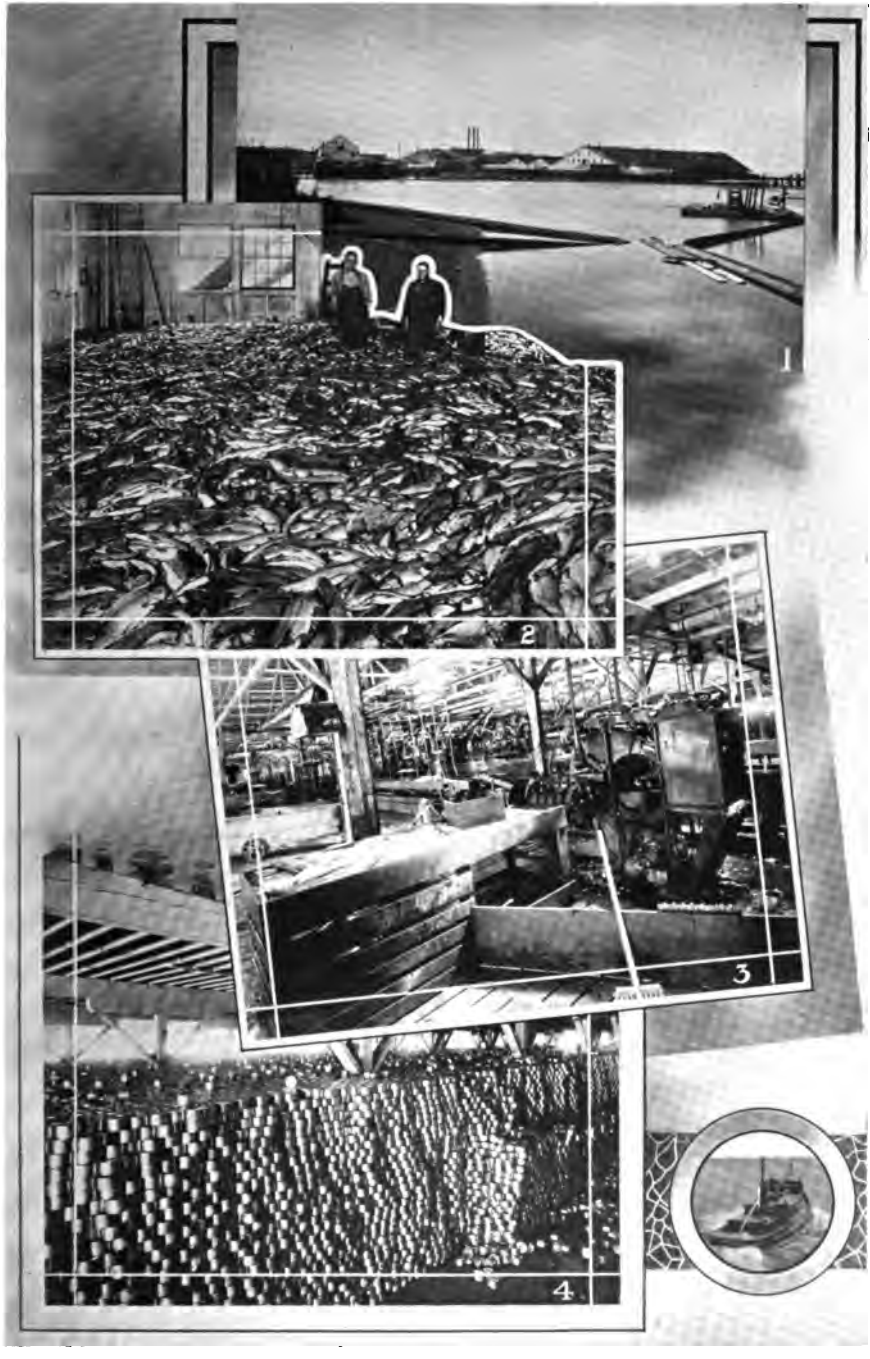
Topography: The islands present various topographical features. From a shore line deeply indented, the land rises sometimes gradually and often precipitously to the low timber-crowned summits. In the northeast section of Orcas rears Mt. Constitution, the highest eminence in the county, with a final elevation of 2,408 feet, reached by a picturesque winding road, skirting pretty lakes, thick forests and fertile areas, and commanding at times a comprehensive view of the island-dotted Sound below. Other mountains of lower elevation are to be found on the other large islands, with many pretty little valleys nestling in between.

Population. According to the 1920 census, there are 3,605 persons making their permanent homes on these islands. About a third are located on Orcas Island, two-fifths on San Juan Island and one-fifth on Lopez. In addition to American-born citizens, a fair percentage of Norsemen and Icelanders dwell here, having been attracted by the fishing advantages offered. The summer population is of course very much greater.

Lands: Sloping back from the water's edge or lying in the many little valleys, considerable good agriculture land is found. Nearly all is privately owned and is being gradually cleared for cultivation. Some is excellent for grain and all suitable for orchard and truck farming. The total land area of the county is 113,920 acres, of which 1,077 acres are state lands and possibly 600 acres unreserved and unappropriated federal lands. Altogether about 105,000 acres are subject to taxation. Of this, 70,000 acres are fenced but less than 16,000 acres are reported as under cultivation. A large additional acreage can be extensively farmed when cleared, and much more is suitable for grazing.

Soils: The soil is mostly a rich calcareous brown loam, rich in phosphates, these ingredients being added from the decomposing limestone cliffs, ocean vegetation and forest droppings. On most of the islands are found occasional pieces of rich beaver dam lands, bottom lands, peat marshes and prairie lands. Seed-peas have been found a specially profitable crop. Oats yield about 60 bushels to the acre, wheat 50 bushels and potatoes three to ten tons.

Climate: The western slope of San Juan Island is somewhat exposed to the outer ocean blasts, but its eastern slope and the inner islands, shielded by this one and washed by the warm Japan current, enjoy unusually pleasant climatic conditions the year round. The mean annual temperature is about 49 degrees, the average daily variation being about 25 degrees. The annual precipitation is about 30 inches, divided into six inches in the spring, 12 inches in winter, three inches in summer, and 9 inches



WASHINGTON'S FAMOUS SALMON FEEDS THE MULTITUDES.

(1) One of our largest canneries. (2) Over 50,000 salmon on the floor.
(3) The inner works. (4) Ready for market.

OUR MINERAL RESOURCES ARE VARIED AND ABUNDANT, BUT HAVE THUS FAR BEEN SCARCELY TOUCHED.

(1) A cement factory. (2) A silica plant. (3) A cyanide mill. (4) Taking out coal.

during the autumn months. Contrary to what might be expected, very little fog occurs on the islands themselves, although there is considerable on the surrounding water. Southerly winds prevail. Growing season is 200 days or more.

Prices of Land: Unimproved tracts suitable for miscellaneous farming, dairying, stock raising, fruit growing, etc., can be obtained at from $10 to $50 per acre; improved land may be purchased at from $75 to $250. Prairie lands are worth about $100 per acre. Many beautiful nooks, containing a little arable land and suitable for summer retreats or permanent retirement can also be acquired.

Resources and Industries: Some of the largest beds of kelp on Puget Sound lie along the coast of these islands, and the surrounding waters yield large quantities of salmon and support a number of fair-sized canneries. Crab fishing and clam digging are also established enterprises. On the islands themselves is much lime, sandstone and cement material; and veins of gold, silver and copper have been uncovered, but little done towards their development. There is also a limited acreage of marketable timber on the upland, well stocked with deer and Chinese pheasants. Trout is plentiful in the lakes. Water power will sometime be developed from Trout lake, Cascade lake, Mountain lake and Sportsman lake.

The most important manufacturing is in connection with the immense lime deposits, some of which run almost chemically pure. The Roche Harbor Lime Company, located on the northwest shore of San Juan Island operates 13 kilns, with a daily capacity of 1,500 barrels. This is a perfectly equipped plant, making its own packages and possessing wharfage facilities for direct shipping to the world markets. Smaller plants are in operation on this and Orcas Island.

Cattle, sheep, poultry, dairying and horticulture are all profitable and the growing of seed-peas is receiving special attention. There are three times as many sheep on these islands as in any other county in Western Washington. Creameries are operated at Friday Harbor and Richardson. Considerable hay is exported. First class commercial apples, pears, cherries, plums and prunes are raised and berries are very successful. Pure, clear running water is plentiful in streams, springs and wells.

Transportation: A number of passenger and freight steamers and several commodious launches touch at nearly every town and village and afford cheap transportation to Bellingham, Anacortes and Seattle. The waters are thronged with fishing vessels and the world's commerce passes near its southern and western shores.

Social Conditions: Throughout the summer months the islands become the playgrounds and resorts of the people of Puget Sound and British Columbia. Resembling, as they do, the Grecian archipelago and the islands of the St. Lawrence, the fame of their charms has spread to all parts of the globe. During the long summer evenings the beaches are aglow with camp fires and the air vibrant with the lilt of laughing voices. At Rosario, in Orcas Island, is one of the most beautiful private estates on the Pacific Coast. Within the music hall of its fireproof mansion may be heard the thrilling chords from one of the most costly pipe organs. Churches and schools and mail delivery are ample, there being 27 school districts, three high schools, 18 postoffices and four rural routes.

CITIES AND TOWNS.

Friday Harbor: County seat. The only incorporated town in the county. Altitude 75 feet. Population, 1920, 522. A fishing and farming center on the east shore of San Juan Island. It is the home of the biological station of the University of Washington and the supply station for the San Juan fishing fleets. It has a United States customs house, two salmon canneries, a creamery, brick and tile plant, newspaper, bank, a new fireproof courthouse, two small parks, electric lights, good water, and volunteer fire department. Four churches and a four-year high school are maintained. Several Sound steamers stop daily.

Roche Harbor: A town of about 250 people, on the northwest shore of San Juan Island. Its principal industry consists of what are probably

and the Snohomish and Skykomish in the southern half. These valleys broaden out near the Sound and take in a large area of rich delta flats. The remainder of the western half of the county consists of rolling uplands, spotted here and there with swampy depressions and meadows, and studded with many pretty lakes. Towards the east the timbered foothills gradually increase in altitude and roughness until the summits of the Cascade mountains are reached at the eastern extremity, dominated in this vicinity by Glacier Peak, 10,436 feet above sea level. Much of the county is logged off and eminently suited to dairying. The extensive waterfront is almost one continuous harbor.

Population: In 1910 there were 59,209 people living in the county which represented an increase during the decade of 148 per cent for the county as a whole and 216 per cent for the city of Everett, where nearly half the people dwell, and ranked the county fourth in the state in this respect. A healthy growth has taken place during the past ten years. The 1920 census recorded 67,690, an increase of 14.3%. Germans and Canadians are prominent among the foreign-born.

Soil and Climate: The many varieties of soil are all intensely productive. The river bottom lands and the extensive deltas formed by former flooding are a rich brown sandy loam, the deposits of decomposing porphyritic and calcareous glacial silt. Much of the uplands also are so formed and enriched by the detritus of its ancient vegetation. All are admirably adapted to the growth of cereals, vegetables, fruits and grasses. No irrigation is needed, the annual precipitation in the farming section ranging from 30 inches near the Sound to 60 inches in the foothills. The heaviest rains occur between November 1 and April 1, but from six to nine inches are distributed during the summer months. Growing season at Snohomish is recorded as 178 days.

Lands: This county contains approximately 1,320,960 acres of land area, of which 22,490 acres are included in the Tulalip Indian reservation, 632,120 acres are locked up in the forest reserves, 24,271 acres are state lands subject to purchase, and 32,740 acres are unreserved and unappropriated government lands. Practically all the remainder is now surveyed and occupied. About 50,000 acres are improved and under cultivation, 159,000 acres are privately owned timber lands and 369,000 acres are stump lands. At least 200,000 acres of this stump land is suitable for agriculture and all of it good for dairying and stock raising. There is also a large area of reclaimed tide flats well adapted to intensive farming or truck gardening.

Prices of Land: Unimproved bench lands, including "cut-over" land and some partially slashed or cleared, is worth from $15 to $75 an acre. When improved it costs from $75 to $200 an acre. The best valley lands run from $75 to $150 unimproved, and from $100 to $300 improved. Exceptional pieces highly improved and close to larger cities will go even higher. Depending on its use, from five to twenty acres is sufficient for a family. Land can be bought on time and also leased.

Resources and Industries: Lumbering, dairying, fishing, horticulture, mining and manufacturing are all important. The dense forests of fir, cedar, spruce, and hemlock will for years furnish material for the many lumber and shingle mills and woodworking establishments located throughout the western part of the county. Practically every city and town is affected by this resource either directly or indirectly. About eight billion feet is privately owned and between four and five billion feet remain on the public lands and reserves.

Dairying is the most important agricultural pursuit and has possibilities for large development on the logged-off lands. There are three big condenseries, located at Snohomish, Stanwood and Monroe; and eight large creameries distributed among as many towns. To support these plants, 16,000 high grade cows are kept by the dairymen and ranchers. Most of the milk is sent to the condenseries, but butter valued at $500,000 annually is manufactured and milk and cream to the value of $150,000 are retailed in the large centers. Many hogs are raised as a side product.

Horticulture and general farming are also found very profitable. About 300,000 bushels of oats and 400,000

bushels of potatoes are raised annually. The county contains about 80,000 apple trees, 22,000 plum, prune and cherry trees, 12,000 pear trees and many acres of berries of all kinds.

The fishing industry is represented chiefly by the salmon fisheries which are gradually growing in importance. A number of large canneries are already established and the industry is further encouraged by the presence of four state fish hatcheries.

Within the Cascade range is an extensive mineral belt somewhat prospected but scarcely touched at present. Among the minerals discovered are cement materials, clay, coal, granite, limestone, marble, copper, lead, zinc, gold, silver, iron, molybdenum and arsenic. Considerable copper has been shipped from the vicinity of Index and the outlook for its further development is encouraging. A little gold and silver has also been mined.

Manufacturing is at present made up chiefly of lumbering and woodworking, food preserving and shipbuilding. Its future development will be aided by the growth of all other industries and by the vast water power in the Sultan, Stillaguamish and Skykomish rivers and a number of smaller streams. The Stillaguamish is said to have 220,000 and the Skykomish 240,000 possible horsepower.

Transportation and Highways: This county is exceptionally well provided with facilities for transportation. The Great Northern serves the coast region and the Snohomish and Skykomish valleys. The Northern Pacific parallels the coast line a few miles to the east, and connects with branches to Silverton and Darrington. The Chicago, Milwaukee & St. Paul operates from Everett into the Snohomish valley and connects with through trains going east, and trolley cars give hourly service from Everett to Seattle and Snohomish. The total steam railroad trackage is 403 miles. In mileage of paved highway this county leads the state and its gravel roads are generally in excellent condition. Stages run from Everett to practically every town in the county.

In addition to these advantages there are 40 miles of waterfront and the Snohomish river is navigable to Snohomish, a distance of 12 miles. Everett, Stanwood and Snohomish are all served by steamers. A new feature is a ferry from Everett to Whidby Island.

Social Conditions: With the rare opportunities afforded for material development and rapid transportation, social progress is materially aided. Nothing of a public nature is neglected that will enable every person to get an education and to satisfy his inborn tastes for recreation, home comforts, religion, music, architecture and art. Public bodies, churches, women's clubs, and fraternal and benevolent societies are well established. There are 14 newspapers, 78 school districts, 18 high school districts, seven private schools, 53 postoffices and 19 rural routes. In all the larger centers, libraries, parks and theaters have been located.

CITIES AND TOWNS.

Arlington: Altitude 103 feet. Population 1910, 1,476; 1920 census, 2,028. Located at the confluence of the north and south forks of the Stillaguamish river on the Northern Pacific railroad, 18 miles north of Everett. Several logging camps, sawmills and shingle mills, are in the vicinity and dairying is important. A large modern cooperative condensery has just been built by the dairymen. It also has a creamery, cheese factory, two machine shops, several garages, two banks, newspaper, modern high school, seven churches, electric lights, water and sewerage system and paved business streets.

Darrington: A town of about 200 people in a pretty valley 28 miles east of Arlington and reached by stage and Northern Pacific trains. It has a lumber and shingle mill, a spar works and all the necessary community business enterprises. Good school and church facilities are provided.

Edmonds: The "Midway City." Altitude, sea level to 300 feet. Population 1920, 936. Located on the main line of the G. N. railroad, facing the Sound, halfway between Seattle and Everett. In addition to frequent steam trains, hourly service is maintained to these cities by auto stages and an electric railway two miles east. Sound steamers also stop here. Many workmen of Seattle make this their home. It has six shingle mills, a wooden drum fac-

brary, and city park; and is provided with municipal water, sanitary sewer system, electric lights, gas, paved streets and concrete walks. Actual value of taxable property is about $3,000,000.

Stanwood (including East Stanwood Precinct): Population 1910, 554; 1920 census, 1,180. Located on the Great Northern coast line and Stillaguamish river, near tide water, 23 miles north of Everett. Rich diked land, noted for fertility and specially suited for dairying and diversified farming, surrounds it. City has two banks, newspaper, several saw and shingle mills, a large condensery, gravity water system, modern sewerage system, paved streets, a four-year high school, a private school, three churches, and several garages and hotels. Water transportation to Sound cities is afforded and stages operate to Mt. Vernon and Everett.

Startup: Altitude 145 feet. A trading center in the Skykomish valley, on the Great Northern railway and the scenic highway soon to be completed by the State. Good farming lands are adjacent. It has three churches and a four-year high school.

Sultan: Altitude 107 feet. Population 1910, 576. Present estimate 700. Located on the Great Northern railway, at the confluence of the Skykomish and Sultan rivers, 25 miles southeast of Everett. Heavy timber, rich mining prospects and good dairy lands are adjacent. Saw and shingle mills are in operation. It also has a bank, newspaper, a four-year high school, four churches, hospital, municipal water system, paved streets, cement walks and city park.

Three Lakes: Altitude 600 feet. A lumber and shingle town of about 500 population, five miles northeast of Snohomish. Stages and a logging road connect with the Great Northern, Northern Pacific, and Chicago, Milwaukee & St. Paul railways. Good church and school facilities are provided.

Tulalip: An Indian town and agency headquarters for the Tulalip Indian Reservation, eight miles north of Everett by boat and 40 miles from Seattle. The United States Indian Boarding School is located here attended by about 200 children. Much logged-off land is available and an Indian fair is held each October.

KING COUNTY.

This county is central in Western Washington and faces on Puget Sound with a mainland frontage of over 40 miles. Its total area including Vashon Island is 2,111 square miles. Although 10 counties in the state are larger and several others are of almost equal size, yet in population and commercial importance it leads them all. This preeminence is brought about primarily by the favorable location of its principal city as to resources and transportation advantages.

Topography: The western half of the county is occupied by a number of fertile valleys trending generally north and south and alternating with wide level or rolling plateaus of varying altitudes. The most important of these is the White River valley, which merges with the Puyallup valley near Tacoma in Pierce county and with the Duwamish near Seattle, and is joined also by the valleys of the Green, Cedar and Black rivers from the east. The three principal valleys are as one. They are from two to four miles in width and are followed by the transcontinental railroads and the Pacific Highway between Seattle and Tacoma.

Another important valley is that formed by the Snoqualmie river flowing north behind the second chain of hills and uniting with the Skykomish, in Snohomish county, to form the Snohomish river. Still other valleys of lesser extent are created by the many little streams flowing into Lake Washington or Lake Sammamish. The first of these lakes, one of the largest in Western Washington, is from one to three miles wide and 19 miles long and for part of its length becomes the eastern boundary to the city of Seattle. This lake is now connected with the Sound by a government canal which utilizes Lake Union in the heart of the city as a part of its course.

The eastern part of the county is occupied by the timbered Cascade mountains, whose foothills blend with the high benches and plateaus tributary to the valleys described

Hay is the second crop in importance in the state, amounting to $44,000,000 in 1919.
1—A field of clover. 2—Cutting alfalfa. 3—Timothy.

and whose higher crests reaching a maximum elevation of 7,000 feet form the zigzag terminal line marking the beginning of Kittitas and Chelan counties.

Population: This section of the state has increased in population much faster than elsewhere. Census figures for 1910 recorded a total for the county of 284,638, or an increase during the decade of 158.6 per cent. Of these, 239,934 were in Seattle and Renton, leaving 44,934 for the rest of the county. A large increase has occurred within the past 10 years the 1920 census recording 389,240, a gain of 104,603. Nearly all foreign nationalities are represented; the most prominent are Canadians, Scandinavians, Germans, English, Italians, Japanese, Chinese and colored.

A large floating population also exists, consisting of those outfitting for Alaska or embarking for Russia or the Orient, fishermen and miners passing the winter here, and many tourists who make the Puget Sound country their summer headquarters.

Soil: There are about 14 types of soil of any consequence in the county. The most extensive is a gravelly, sandy loam, which occupies all the bench lands, ridges, and plateaus lying between the foothills and the Sound. Much of this is in the logged-off state; under proper condition it produces profitable crops of hay, potatoes, fruits, strawberries, and other small fruits. Another type, known as the Everett gravelly, loamy sand, also occurs extensively in the rolling upland and is suitable for fruit growing, early truck crops and pasturing. The richest types are the silt loams that occur in the White river, Duwamish and Snoqualmie valleys and along a few other smaller streams. These are partially derived from glacial deposits enriched by later decaying matter. Such land is generally level and easily cultivated and yields heavy crops of hay, berries, vegetables, fruits, etc. There are also a few muck and peat beds and a little so-called tidal marsh.

Climate: In the western half of the county where practically the entire agricultural area and population are found, the characteristic Puget Sound climate prevails, with no extremes of either heat or cold. The summers are modified by the cooling breezes from the west and the winters by the mysterious warm ocean currents. The temperature never drops to zero and only occasionally reaches the freezing point. The mean minimum temperature for a period of 23 years at Seattle, in January, the coldest month, is 35.7 degrees, and during July and August, 54.6 degrees. The mean maximum for same period is 44.5 degrees in January and 73.2 degrees in July. The average length of growing season is 244 days. Prevailing winds are from the southeast. Annual precipitation is from 22 to 35 inches, but more than half of it falls during the months of November, December, January and February. The average for the past eight years was 29.92 inches.

The normal temperature by months for a 33-year period is as follows:

January	39	July	64
February	40	August	63
March	44	September	58
April	49	October	51
May	55	November	44
June	60	December	41

Lands: The total land area is 1,351,040 acres. The Rainier and Snoqualmie national forest reserves still retain 218,504 acres; the state owns 49,454 acres subject to purchase; about 58,960 acres are unappropriated and unreserved federal lands, described as "rocky and mountainous"; and the remainder, except 3,491 acres in the Muckleshoot Indian reservation and limited portions held for military or other public use, has passed into private ownership. This county was originally all covered with a dense forest, reaching to the water's edge. Gradually the valleys and plateaus provided with the best transportation facilities have been cleared of whatever is merchantable and much of it placed under cultivation. The total area improved, however, does not exceed 65,000 acres. In addition to the national forest there yet remain about 300,000 acres of privately owned timber lands and over 450,000 acres are in the logged-off state.

There is no so-called prairie land in the county, but thousands of acres lie as level as could be desired, especially in the principal valleys and on a few benches. A large proportion of the logged-off

land would be well suited to crops when cleared of stumps, and practically all, even in its present condition, can be used for dairying and stockraising pursuits.

Prices of Land: In this county where there is much land most favorably located and some that is still wild and remote, a wide variation of prices naturally prevails. The rich delta lands of the rivers, traversed by steam railroads, trolley lines, and cement or brick auto roads, brings the highest prices. Improved lands close to the cities where the milk condenseries and other plants for utilizing the products exist, command from $200 to $1,000 per acre. Such prices of course do not include lands especially desirable for commercial or speculation purposes. Valley slopes and bench lands only partially improved will bring from $100 to $250 per acre. Wild land with stumps and brush remaining, but of good soil and easily reached, fetches from $50 to $125. Further remote choice land can be had for from $25 to $75, while hilly regions suitable only for stock raising can be obtained for from $10 to $25.

Resources and Industries: The aggregate actual value of all taxable property in this county amounts to $625,203,739, or one-third of all the taxable property of the state. To this huge sum contributions are made by practically all lines of industry carried on anywhere in the Northwest, for nearly all basic resources are found here. Timber, mining, water power, agriculture, fishing, manufacturing and commerce, each plays an important part.

Timber: Chief among the defined and developed resources is the yet standing timber, which conservative estimates place at about 15 billion board feet. It covers the foothills and lower mountain heights, and extensive areas are found near some of the cities. The principal trees are fir, cedar, spruce and hemlock. The yearly cut supplies logs and shingle bolts for some of the large mills of the state and many additional logs are brought in from other counties. Reforestation is already being practiced and will tend to maintain the present large output indefinitely.

Mining: Coal, clay products, cement materials and building stone make up the most important mineral output, but gold, silver, copper, iron and arsenic have been discovered and are expected to be mined in commercial quantities some day. The coal, the most important output, averages over a million tons yearly. Prospecting for oil is being carried on and wells are being sunk.

Agriculture: The chief agricultural enterprise is dairying, in which respect this county leads the state. Over 25,000 milch cows including a number of famous herds were counted in the spring of 1919, yielding to the dairymen millions of dollars in butter, cream and milk. The county supports 11 creameries, with an output of nearly four million pounds of butter yearly, and six large condenseries. In addition, close to $2,000,000 worth of milk and cream is sold annually. Other livestock includes about 5,000 hogs, about 8,500 stock cattle, and about 14,000 horses and mules. This is also the leading poultry county and many large modern poultry farms are yielding profitable returns in utility and fancy eggs, day-old chickens, and dressed poultry. Market gardening, berries and fruit are all carried on to advantage. The county contains about 82,000 apple trees, 24,000 pear trees, 4,000 peach trees, 18,000 plum and prune trees, and 28,000 cherry trees. The earliest strawberries in this section of the state are raised on Vashon Island lying between Seattle and Tacoma. Nuts have also been proved suitable for the district.

Water Power: The possible water power is enormous. It is estimated that the White river and its tributaries can produce a maximum of 285,000 h. p., Cedar river 200,000 h. p., and the Snoqualmie river 400,000 h. p. About 100,000 h. p. has thus far been developed. The most important power sites erected are at Cedar Falls and Snoqualmie Falls, the latter having a sheer drop of 268 feet.

Manufacturing and Shipbuilding: Manufacturing has reached immense proportions. The output of the county in 1914 was about $80,000,000, or about one-third of all manufactures in the state. During subsequent years it increased in a remarkable degree but accurate estimates cannot be made. The total included many big steel and wooden ships that were built for the World war. In addition to shipbuilding prac-

tically every other class of enterprise is represented. The different plants are mentioned in connection with the cities and towns described elsewhere. Among the most conspicuous are lumber and shingle mills, miscellaneous wood product concerns, feed and cereal mills, meat packing plants, machine shops and foundries, clay products plants, milk condenseries, canneries and cracker, candy and shoe factories. The most important manufacturing centers in the county outside Seattle are Renton, Auburn and Kent.

Commerce: Its commanding geographical position and the resulting excellent transportation facilities have been important factors in gaining for this county great prestige as a commercial and financial section. It has large influence in the traffic with Siberia, Japan, China, the Philippines, Australia, South America and Europe. The total value of all imports and exports through the port of Seattle for the year ending December 31, 1918, amounted to $792,120,736, thus placing it second among the ports of the world. The total deposits of all banks in the county amount to about $180,000,000.

Markets: The proximity of Seattle, with its population of over 315,000 people and several public market places where the producer can sell his products to the consumer direct, makes easy the disposition of all perishable material. There is never sufficient forage, seed, fruits, poultry, dairy and other animal products to supply even this local demand. Large amounts must be shipped in from Eastern Washington or elsewhere. The markets of the world also bid for the leading articles, especially lumber, shingles and food materials.

Transportation and Highways: Three great transcontinental lines, the Great Northern, the Northern Pacific, and the Chicago, Milwaukee & St. Paul pierce the Cascade mountains at different points in this county to reach the cities of Puget Sound, and the Oregon-Washington Railroad & Navigation Company or Union Pacific comes in from the south. The Canadian Pacific and the Chicago, Burlington & Quincy operate over the tracks of the Northern Pacific, while the Southern Pacific has passenger service over the Northern Pacific and Union Pacific. Steamboat connection is made with the Grand Trunk Pacific. The total steam railroad trackage, which includes the Pacific Coast railway serving the coal mining districts and a number of logging roads, is 851 miles. In addition the Puget Sound Electric supplies hourly service to Everett and Tacoma, and another trolley line provides special service to Renton.

Cities and landings on Puget Sound and Lake Washington are reached by daily or more frequent boat service and a number of steamship companies operate out of Seattle to coast cities, Mexico, South America and Hawaii; also to Oriental, Australian and European ports. Several other lines operate to New York, Boston and European ports via the Panama Canal.

The county has about 1,300 miles of highway, much of which is either cement or brick, and includes an extensive boulevard system. The most important arterial highways are the Pacific Highway which is paved in the county and the Sunset Highway leading across the Cascades. A number of stage lines have established regular schedules out of Seattle, which is also headquarters for the Western Washington Automobile Association.

Social Conditions: Metropolitan advantages are offered for development in every branch of social, educational, religious or professional endeavor. Advantageously placed are schools, churches, libraries, theaters, parks, playgrounds, boulevards, etc. All institutions are representative of the West at its best and are most modern in architectural design and finish, and progressive in thought and methods employed. There are 129 school districts, 39 high school districts, and 34 private educational institutions, consisting of elementary schools, academies, and colleges, both parochial and sectarian, besides the Washington State University, which ranks with the great universities of America. There are 26 women's clubs in good standing and all the fraternities known are represented. There are 86 newspapers and periodicals published, 72 of which are in the city of Seattle. Mail is distributed by 88 postoffices and 29 rural routes. Rapid trans-

mission of messages is assured by 158,949 miles of telephone wire and 1,372 miles of telegraph wire. Such agencies aided by unusual transportation facilities on land and water have developed strong bonds of friendship among the various localities and encouraged the highest social progress.

Vashon Island.

Lying out in the Sound, midway between Seattle and Tacoma, is an important subdivision of King county, consisting of two islands, Vashon and Maury, connected by a narrow isthmus at a point called Portage. The two are generally known as Vashon Island. It is 12 miles long and from one to four miles wide. Its total area is approximately 34 square miles or 21,760 acres, and its water frontage 48 lineal miles.

Much of the surface is at present covered with timber or is in the logged-off state, but considerable is highly improved, demonstrating the general fertility of the soil and its adaptability to a large variety of crops. Orchard fruits, berries, and vegetables grow to perfection and nuts such as filberts, English walnuts and almonds can be raised profitably. The island has been called the "Pear Heaven" and this industry is being taken up by many growers. But it is most famous for the early strawberries, which are eagerly bought as soon as they appear on the market. Flowers do especially well and 300 varieties of dahlias have been raised on a single tract. Several greenhouses are maintained, one of these near Vashon, being the largest in the West. Poultry is also a profitable industry and many crates of eggs are shipped annually. Some dairying is carried on and a cheese factory is supported at Vashon. Additional industries include a cannery, saw and shingle mills and gravel pits

The entire resident population is about 5,000, with an added summer population of about 2,000. The most important settlements are Vashon, Burton, Lisabeula, Cove, Colvos, Portage, Ellisport, Center and Dockton. Seven postoffices are maintained, seven grammar schools, two high schools, nine churches, a Y. M. C. A., a Commercial Club, Improvement Club and an Auto Club. A bank and weekly paper are supported and continuous light and power is supplied. The entire valuation of the island for taxation purposes is $3,626,000.

Four daily trips are made by the Vashon Island ferry from Des Moines, a town midway between Seattle and Tacoma, to Portage, and three daily trips by the Kitsap county ferry which runs direct from Seattle to Harper, touching at the upper end of the island. Another ferry has just been established between Burton and Tacoma. Several steamers from Seattle and Tacoma also stop at the different landings. Fifty miles of highway reach every important settlement and farm district.

CITIES, TOWNS AND VILLAGES

Algona: A dairying and farming center of about 500 population, located on the Chicago, Milwaukee & St. Paul and Puget Sound Electric railroads, two miles south of Auburn. Berries, fruits, and vegetables are raised at a profit. It has two churches and a grade school. High school pupils attend at Auburn.

Auburn: Altitude 90 feet. Population 1910, 957. Census of 1920, 3,163. A farming and dairying center in the White River valley, on four trunk railroads and the Puget Sound Electric, midway between Seattle and Tacoma. It is also a junction point for the Northern Pacific railway, which maintains yards here with a large monthly payroll. Saw and shingle mills are operated in vicinity. It has a large milk condensery, tile manufacturing concern, grist mill, ice plant, six churches, a high school, two banks, a newspaper, a public library of 3,000 volumes, gravity water system, electric lights, volunteer fire department and four miles of paved streets. Stages run to Enumclaw, Buckley and Black Diamond. Actual taxable wealth amounts to $2,210,000.

Black Diamond: Elevation 610 feet. Population about 1,200; chiefly Welch, Italians and Austrians. A company town located on the Pacific Coast railway, 31 miles southeast of Seattle. Coal mining is chief industry, about 300,000 tons being shipped yearly. It has a bank, two general stores, garage, meat market, three churches, a four-year high school, electric lights and city water. Auto stages run to Seattle and Auburn.

Bothell: Altitude 54 feet. Population 1920, 613. Located near the north end of Lake Washington on the Sammamish river, the Northern Pacific railway and Pacific Highway, about eight miles from Seattle's northern limits. Hourly stages run to Seattle and Everett. It serves as a sort of metropolis to the many small tributary farming villages or communities, and maintains a glove factory, a fruit cannery, a bank, newspaper, four-year high school, public library, three churches, electric lights, and good water supply. In the vicinity are saw and shingle mills and much good farm lands devoted to dairying and truck gardening.

Burton: Altitude, tide level to 150 feet. A farming center and summer resort, of about 300 people, near the south end of Vashon Island, on Quartermaster Harbor, eight miles from Tacoma. It has several greenhouses, boat yards, general stores and hotel; also a four-year high school, two churches and a newspaper. Stages are provided to island points and steamers and ferries to Seattle and Tacoma.

Cumberland: A coal mining town of about 400 population at the foot of the Cascade mountains, seven miles northeast of Enumclaw. Poultry raising is also important. There are three coal companies and about 110,000 tons of coal are shipped annually.

Des Moines: A summer resort and the mainland landing place of the Vashon Island ferry, midway between Seattle and Tacoma. Stages connect with each of these cities. Two garages, a number of pretty hotels and good school and church facilities are provided.

Duvall: Elevation 39 feet. Population, 1920 census, 258. Located on the Great Northern and Chicago, Milwaukee & St. Paul railways, in the Snoqualmie valley, 10 miles south of Monroe. It has two shingle mills and a sawmill, and is surrounded by much good farming land. A bank, high school, church and electric lights are provided.

Enumclaw: Altitude 742 feet. Population 1910, 1,129. Census of 1920, 1,378. Beautifully located on a plateau or glacial moraine at the foot of the Cascades, 34 miles east of Tacoma where the McClellan Pass Highway enters the forest-covered foothills. The completion of this road will induce many tourists to visit this little city. There is much excellent fire clay just out of town, and much fertile undeveloped farm land. Dairying and general farming are important. City has two banks, two weekly papers, sawmill, shingle mill, condensery, creamery and cement plant. It also has a four-year high school, four churches, five fraternal organizations, municipal water, electric lights, paved streets and walks and a volunteer fire department. Railroad service is rendered by the Northern Pacific and a spur of the Chicago, Milwaukee & St. Paul. Stages operate to Tacoma, Buckley and Selleck.

Issaquah: Altitude 97 feet. Population 1910, 628. Census of 1920, 791. Situated in a fertile valley suitable for dairying and truck farming at the southern extremity of Sammamish lake, and surrounded by heavily timbered hills which lead up to the Cascade mountains. It is served by Northern Pacific trains and auto stage to Seattle, 12 miles away in direct line, but 26 by the highway and 42 by train. Two large coal mines are operating, also a large milk condensery, a planing mill and several sawmills. It has a newspaper, bank, three churches, a high school, six fraternal organizations, volunteer fire department, city park, moving picture show and several garages.

Kennydale: Elevation 223 feet. A suburban town of about 500 people near the southeast extremity of Lake Washington. It is served by the Northern Pacific and Pacific Coast railways. Hourly boat service is also maintained to Rainier Beach. Land is suitable for market gardening and floriculture. Nearby are producing coal mines. A creosote works and spar company are also in operation. It has two churches and electric lights.

Kent: Altitude 42 feet. Population 1910, 1,908. Census of 1920, 2,282. A thriving farming town in the heart of the White River valley, midway between Seattle and Tacoma, on the line of all the trunk railways as well as the Puget Sound Electric and the Pacific Highway. In the vicinity are a number of large poultry farms and dairies. Among its

local industries are a large milk condensery, wire manufacturing plant, Simplex bed factory, three sawmills, shingle mill, incubator factory, a beehive factory, a rubber plant, a cannery, and a can factory. Value of manufactures in 1918 was estimated by the Chamber of Commerce at $3,310,000. City also has two banks, a newspaper, a four-year high school, nine churches, three small parks, 7¾ miles paved street, 4½ miles cement walk, and a paid fire department. Actual value of taxable property is $2,500,000.

Kerriston: Altitude 1,214 feet. A logging camp and sawmill town of about 250 people, located on Raging river and a branch of the Northern Pacific railway, about 55 miles southeast of Seattle. Much good agricultural land surrounds it.

Kirkland: Altitude 20 feet. Population 1910, 532. Census of 1920, 1,354. A pretty city on the Northern Pacific railway and the east shore of Lake Washington opposite the northern limits of Seattle. Hourly ferries operate to Seattle where many of its people work, and stages run to Redmond and Issaquah. It has a large woolen mill, shingle mill, a bank, newspaper, a four-year high school, municipal water works and electric lights. A government canal gives direct water communication with Puget Sound.

Maple Valley: A farming center with about 400 postoffice patrons, located on the banks of Cedar river 23 miles southeast of Seattle. It is served by the Pacific Coast and Chicago, Milwaukee & St. Paul railways. Logging and lumber manufacturing are carried on in vicinity and several coal mines have just opened up. Stages operate to Seattle and Black Diamond.

Newcastle: A coal mining town of about 800 people located on the Pacific Coast railway, six miles northeast of Renton. The Coal Creek mine produces over 200,000 tons of coal annually. Electric lights, two churches and good schools are provided.

North Bend: Elevation 456 feet. Population 1910, 299. Census of 1920, 387. An agricultural and dairy center on the Chicago, Milwaukee & St. Paul and Northern Pacific railways and the beautiful Sunset Highway, at the head of the Snoqualmie valley, 25 miles due east of Seattle. It is the last town before going over the pass and tourists tarry in each direction. A big sawmill is near and much logging is carried on. Large quantities of milk and cream are shipped to Seattle. City supports a newspaper, bank, four-year high school, a church, two hotels, two garages and a public park, and enjoys electric lights and a good water system.

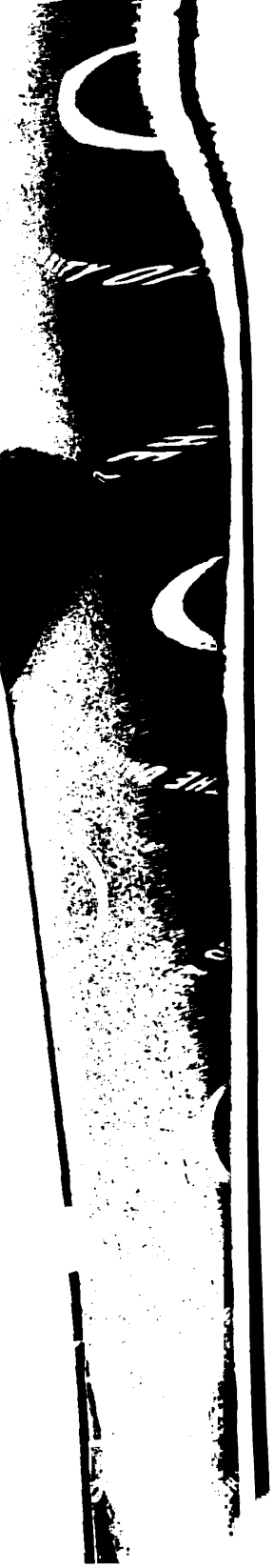
O'Brien: Elevation 33 feet. A farming community of about 300 population, 2½ miles north of Kent and possessing the same transportation facilities. Dairying is the chief industry. A church and good school facilities are provided.

Pacific: Population 1920, 320. A farming center located on the Puget Sound Electric railway, 3½ miles south of Auburn. Tributary land is excellent for truck gardening. Two churches and a high school are maintained.

Preston: Altitude 508 feet. A lumber and shingle manufacturing town of several hundred people, principally Scandinavians, located on the Northern Pacific railroad and the Sunset Highway, 14 miles due east of Seattle. A large mill is in operation. School and church facilities are adequate. Stages operate to Seattle.

Redmond: Altitude 53 feet. Population 1920 census, 438. Located on the Northern Pacific railroad, 10 miles due east of Seattle. Several shingle and lumber mills are operated in the vicinity, and dairying and poultry raising are important. Stage runs to Kirkland and auto trucks make daily round trips to Seattle. It has a bank, two churches, a four-year high school, newspaper and electric lights.

Renton: Altitude 40 feet. Population 1910, 2,740. Census of 1920, 3,301. Located at the southern extremity of Lake Washington on the Northern Pacific, Chicago, Milwaukee & St. Paul, and Puget Sound Electric railways, four miles south of Seattle's city limits. Its principal industry was originally coal mining, but manufacturing is fast forging to the front, the lowering of the lake revealing a large area of sites ideally located, both for deep water and railroad transportation. Among the enterprises located here at present



are the mines of the Puget Sound Electric railway, the largest units of the Denny Renton Clay and Coal Company, the Seattle Car Manufacturing Company, a two-unit briquette plant, a coal dust factory, a macaroni plant, and a cement factory, besides several other industries, altogether affording a large payroll. The city has two banks, a four-year high school, six churches, one newspaper, municipal water system, paved streets and a fire department.

Richmond Beach: Altitude 20 feet. A farming town and summer beach resort, five miles from the northern limits of Seattle, where many of its citizens have their employment. The beaches are ideal for bathing and the earliest strawberries around Seattle are grown on its sunny slopes. The Standard Oil Company, the American Gas Company and the Union Tank Company all have tanks here. There are two churches and a high school. Transportation is by stage and Great Northern trains.

Seattle: County seat. Altitude, sea level to 500 feet. Area 94.47 square miles, including water. Population 1910, 237,194; 1920, 315,652. Actual value of all taxable property $455,651,464.

This is the largest city in the state and the third in importance west of the Mississippi river. From a tiny village built along the waterfront of Elliott bay, it has rapidly grown until it now occupies the entire eminence of hills, rolling plateaus, and valley-like depressions lying between Lake Washington and Puget Sound and extending 10 miles north and south. It includes within its limits two large lakes, Lake Union near its geographical center and Green Lake in the north central part, and a government canal built at a cost of $3,625,000, connecting the Sound with Lake Washington by way of Salmon bay and Lake Union.

The expansion of the city necessitated the levelling of many original hills and using the earth to fill extensive tide flats, where the railroad terminals and some of the largest manufacturing plants are now located. Other manufacturing has spread further along the salt waterfront, along the shores of the government canal and Lakes Union and Washington and into other sections of the city least desirable for homesites or trade.

The principal business section occupies a comparatively narrow north and south section overlooking Elliott bay, but smaller business centers are located in all sections of the city. Practically all the remaining territory within the corporate limits is occupied by beautiful homes, schools, churches, parks and boulevards, all built to conform with the natural contour and surroundings.

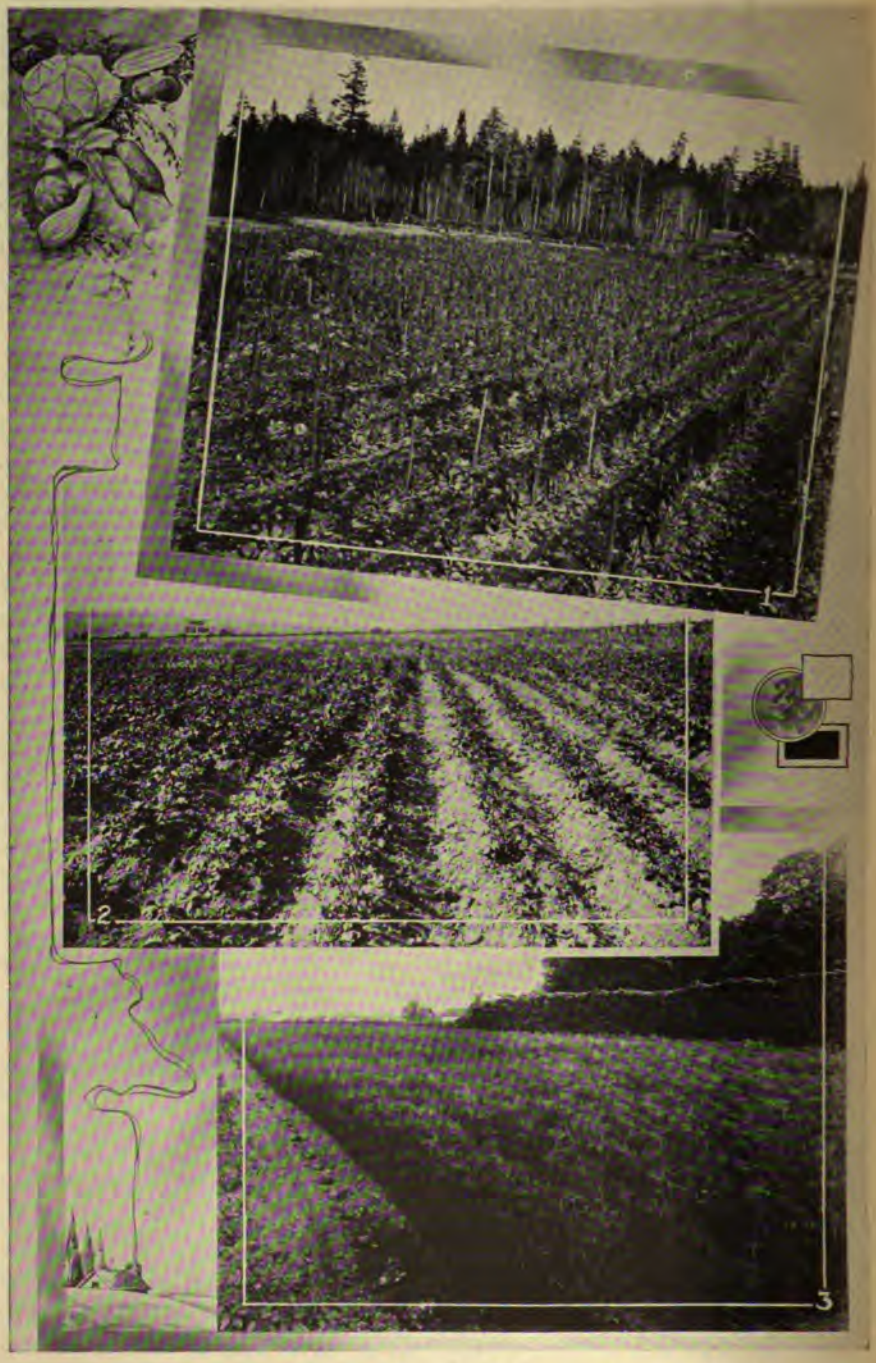
A strategic and attractive location combined with immense tributary resources has been partially responsible for the city's tremendous growth. Logging, agriculture, fishing and mining were among the earliest enterprises but are now reinforced by vast foreign and domestic commerce, shipbuilding and all lines of manufacturing. Manufacturing in 1914 amounted to $64,475,000, which represented an investment of $61,317,496 and gave employment to 15,761 men. During the year 1918 it is estimated that $200,000,000 worth of products were turned out, including many big steel and wooden ships. Practically all other lines are represented, but lumber and timber products, flour, foundry and machine shops products, meat packing and canning are in the lead.

Indicative of the big business transactions in 1918, bank clearings for 15 banks amounted to $1,859,964,752.15; total bank transactions to $3,544,047,026.00; postal receipts to $2,125,486.00; real estate transfers to $2,125,486.00; and building permits to $10,899,775.00. Foreign imports were worth $368,306,395.00 and foreign exports $212,501,489.00.

Four transcontinental railroads enter the city, including the Great Northern, Northern Pacific, Chicago, Milwaukee & St. Paul, and Oregon-Washington; and the Canadian Pacific and Great Western enter over the tracks of these. There are 67 steamship lines, and 26,777 vessels entered and cleared the port in 1918 with a total tonnage of 21,418,247. The port of Seattle, whose business ranked second in the United States in 1918, has a warehouse capacity of 70,000 tons, berthing capacity of 368,800 ton vessels, a grain elevator of 1,200,000 bushel capacity, an oil storage capacity of 9,600,000 gallons

WASHINGTON'S DAIRY OUTPUT IS FROM $20,000,000 TO $40,000,000 ANNUALLY.

(1) The contented herd. (2) Unloading milk at a condensery.



CONDITIONS IN SOME LOCALITIES ARE IDEAL FOR RAISING VEGETABLE SEEDS.

(1) Cabbage. (2) Radish. (3) Caroway.

and a warehouse for 3,000,000 cases of salmon.

The city owns its street railway valued at $15,000,000, which includes 228 miles of trackage and 586 cars, carrying 12,000,000 passengers per month. A privately owned electric railway adds another 21 miles. The municipal water plant represents an outlay of $12,906,434.04 and serves water to 56,646 homes at an average rate of 50 cents per month. There are 718 miles of water main, 6,284 hydrants and a storage capacity of 272,000,000 gallons. The municipal lighting plant which cost nearly four million dollars serves 60,000 customers and lights more than a thousand miles of street, 25 per cent with cluster lights.

Other public improvements include 745 miles of graded street, 298 miles of which are paved; 515 miles of sewer; 902 miles of concrete walk; and three steel Bascule bridges. Street improvements up to date have cost $55,864,230. The city is served with a municipal power plant of 51,000 kilowatt capacity and private plants of 86,000 kilowatt capacity.

Among educational and religious institutions are eight high schools, 75 grade schools, 33 private schools, six standard theaters, 300 churches, a Y. M. C. A., a Y. W. C. A., a Carnegie library with its nine branches and 260,000 books, the State University of Washington, four daily newspapers and 68 weeklies and other periodicals.

Selleck: Altitude 1,070 feet. A lumber and shingle town located in a heavily timbered section on the Northern Pacific and Chicago, Milwaukee & St. Paul railways, 46 miles southeast of Seattle. Good school facilities, electric lights and a gravity water system are supplied.

Skykomish: Altitude 960 feet. Population 1920, 267. A division point on the Great Northern railway, 85 miles from Seattle in the upper part of the Skykomish valley, where the mountain bases reach almost to the river. Several sawmills are operated and prospecting is carried on. A four-year high school, municipal water, and electric lights are maintained.

Snoqualmie: Elevation 434 feet. Population, 1920 census, 450. Located on the North Bend branch of the Northern Pacific railway, 30 miles southeast of Seattle, near the famous Snoqualmie Falls, the huge picturesque power site of the Seattle Light and Traction Company. A big saw and shingle mill is operated close by and several coal mines are in vicinity. It has a bank, newspaper, two garages, high school, church and park.

Taylor: Elevation 1,159 feet. A community of about 400 people, eight miles east of Maple Valley, on the Pacific Coast railway. Various clay products are manufactured by the Denny Renton Clay Company, which also owns the townsite.

Thomas: Elevation 61 feet. A farm town of about 250 people, midway between Kent and Auburn. Transportation is same as for other towns in the White River valley. Lumbering, dairying, berries, poultry and gardening are important.

Carnation (Tolt): Altitude 90 feet. Population 1920, 536. Located in the Snoqualmie valley, on the Great Northern and Chicago, Milwaukee & St. Paul railroads, 20 miles east of Seattle. A vast body of timber is tributary. Land is ideal for dairying. Principal industries are a condensery, fruit and vegetable cannery and sawmill. Two churches, a four-year high school, a bank, and weekly paper are supported.

Tukwila: Elevation 50 to 200 feet. Population 1910, 361. Census of 1920, 453. A pretty farming town overlooking the Duwamish valley, 10 miles south of the center of Seattle. Puget Sound Electric trains and auto stages over the Pacific Highway render transportation service. The growth of Seattle southward means the development of this as a manufacturing community. Flowers, berries and soft fruits are raised in abundance. School and church facilities, good water, and electric lights are supplied.

Vashon: A farming town of about 400, located on Vashon Island. Fruit growing, berries, floriculture and poultry raising are sustaining industries. A bank, newspaper, four-year high school and church facilities are maintained.

KITSAP COUNTY.

This county occupies most of what is known as the Kitsap peninsula, shaped much like an Indian arrowhead, pointing to the north. Its eastern indentations were formed by the main channel of Puget Sound whose principal arm, Hoods Canal, washes the western shores. The entire shore line of the county is approximately 200 lineal miles.

Natural Features: No mountains mark its surface. About 70 per cent consists of gently rolling uplands and the remainder is made up of various plateaus and level fertile valley lands. There are very few steep places, even near the waterfront, which in many localities supplies ideal beaches for swimming or bathing and pretty spots for the summer homes of city dwellers. The elevation varies from sea level to a maximum of about 300 feet. Several islands also belong to this county, the most important of which is Bainbridge, about nine miles in length and one to four miles in width. This island supports a number of small mill towns, numerous ranches and summer homes and several public camping or picnic grounds. Its southern extremity is occupied by Fort Ward.

Population: The census of 1910 credits the county with a population of 17,647, an increase of 161 per cent in ten years. Much growth has taken place since, due principally to the enlargement and improvements of the United States navy yard, located at Bremerton. The 1920 census records 33,162, an increase of about 88 per cent. A large number of Scandinavians are included, also many Germans, Finns, English, Icelanders, French, Danes and Hungarians.

Soil and Climate: The uplands consist principally of a fine sandy loam, well suited for strawberry culture as well as clover and grains. The lower lands consist of clay loams and alder bottom, well fertilized by decayed vegetable matter and suitable for truck gardening, clover, grain and berries, including cranberries. Being practically surrounded by sea water, the gentle breezes from the bay keep the temperature moderate throughout the year. Although there is light freezing during winter months, the frosts seldom injure crops. The mean temperature for July is 62.6 degrees and for January 40.3 degrees. Growing period is about 200 days. Annual precipitation is between 30 and 40 inches, three-fourths of which falls between November 1st and May 1st.

Lands: The total land area is 237,440 acres, practically all of which has passed into private ownership; 8,885 acres remain as state land; 7,284 acres are in the Port Madison Indian reservation; and about 1,304 acres are in military reserves. About 12,000 acres are improved; 168,000 acres are unimproved, principally logged-off; and 43,000 are still covered with timber. At least 70,000 acres more can be placed under cultivation and the remainder will make excellent grazing territory.

Prices of Lands: Prices of unimproved agricultural lands range from $30 to $100 per acre. Land cleared and under cultivation is worth $200 and up per acre, according to quality of soil and extent of improvements. General farm lands are around $250 per acre; hay land from $200 to $300; and orchards from $300 to $400. All lands are accessible to landings and markets. Easy terms may be had and some may be rented for cash or on shares.

Resources and Industries: Agricultural enterprises are gradually assuming first place in the county and will continue to do so as the logged-off lands are cleared or the profitableness of dairying, live stock and poultry is recognized. For poultry raising this is recognized as one of the best localities in the state and the other two industries have been proved very successful. The county has about 2,500 cows, three creameries and a cheese factory. Hay, strawberries and garden truck are the leading crops at present. Tree fruit is represented by 42,000 apple trees, 11,000 pear trees, 3,000 plum and prune trees and 8,000 cherry trees.

The county has about two billion feet of standing timber remaining, which will maintain large logging camps and sawmills for years to come. The principal manufactures

consist of lumber and other wood products and articles connected with the navy yard at Bremerton. Shipbuilding is also important. Water power can be developed at McKenna Falls. Sandstone and clay are the principal minerals.

Some commercial fishing is carried on in the adjacent waters, while game fish of various kinds are caught in the different streams. Deer, grouse and native pheasants are plentiful.

Transportation and Markets: There are no railroads in the county but adequate steamboat service is rendered between all the landings and the large cities on the Sound. A ferry has just been inaugurated from Seattle to Harper, via Vashon Island. Port Orchard, Manette and the Soldiers' Home are also connected with Bremerton by ferry service. Good roads, passable the year round, reach all parts of the county and connect with the ferry at Harper, and the Olympic Highway at Shelton in Mason county. The presence of the navy yard and proximity to Seattle and Tacoma insure a ready market for all surplus products.

Educational and Social: The county is well provided with schools, churches, libraries, postal facilities, grange halls, etc., while the nearness of cities outside the county gives additional impulse to social development. Library and musical clubs are features of community life and the people are generally well-to-do. The villages are connected with each other and the cities by a 3,200-mile network of telephone wire. There are 61 school districts, eight high schools, and three private schools. Mail is distributed by 43 postoffices and eight rural routes.

CITIES AND TOWNS.

Bremerton: Altitude, sea level to 200 feet. Population 1910, 2,993; 1920 census, 8,918. Actual taxable wealth $2,301,460. Located on Port Orchard bay, 16 miles west of Seattle. This city is the metropolis of the Kitsap peninsula, but is noted chiefly as the base of the United States naval station of Puget Sound, which has been the principal cause of its rapid growth. The stationing of a part of the fleet of the Pacific Coast and the appropriation of several millions for navy yard improvement is causing a continued rapid growth. Thousands of men are employed and people come miles to see the huge drydocks or visit the battleships. A number of smaller miscellaneous industries include a creamery and sawmill and a plant for making coal oil burners.

The city has three banks, two newspapers, a four-year high school, two grade schools, 10 churches, public library and public park, substantial public buildings, paved streets and walks, volunteer fire department and 15 fraternal organizations with the ladies' auxiliaries. Transportation is supplied by a fleet of sound steamers and launches. Stages operate to points on the west side of peninsula.

Charleston: Population 1910, 1,062; census of 1920, 3,338. This city is contiguous to Bremerton and the naval station, from which its main support is derived. The state quarry, sawmills and other smaller industries are adjacent. It has a bank, newspaper, four-year high school, two churches, public park, public library, electric lights, good water system and volunteer fire department. Transportation is practically the same as for Bremerton.

Colby: A lumber and shingle town, located on Yukon bay of Puget Sound, 12 miles west of Seattle. It has two churches, a high school and one private school. Many cedar poles and much pile timber are cut here. Transportation is by Seattle steamers and Harper ferry.

Harper: A community of about 200 people, located on a small bay just across from the north end of Vashon Island, 10 miles from Seattle. A large brickyard, a greenhouse and several poultry ranches are adjacent. A ferry makes three round trips daily from Seattle.

Manette: A town of about 800 people recently annexed to Bremerton but separated from it by a narrow channel crossed every half hour by passenger launches. It is supported by the navy yard and fruit and chicken ranches.

Port Blakeley: An important sawmill town, overlooking a pretty bay on the east side of Bainbridge Island, straight across from Seattle. It has a large shipyard and two sawmills, employing about 400 men. The

yearly output is estimated at one and a half million dollars. Two churches, two fraternities and good schools are maintained. Principal transportation facilities are two daily boats to Seattle.

Port Orchard: County seat. Altitude, tide level. Population 1910, 682. Census of 1920, 1,393. This pretty city is located on Port Orchard bay, directly opposite Bremerton and the United States Puget Sound navy yard, from which it derives considerable support. The surrounding country is devoted to general farming and dairying. Among the local industries are shingle mills, a creamery, and a machine shop. The Washington Veterans' Home is located a mile out. A four-year high school, several churches, a bank, a newspaper, and a good water system are maintained. Seven trips by steamer are made daily to Seattle, the same boats stopping also at Bremerton.

Port Gamble: A sawmill town of about 300 people, located on Hoods Canal, 30 miles north of Port Orchard. About 200 men are employed by the Puget Mill Company. Church and school facilities are ample. Daily boat service is maintained to Seattle.

Poulsbo: Population 1920, 546. Located on Liberty bay, 15 miles north of Port Orchard. It serves a community of about 1,500. Its main industries are lumber manufacturing, general farming, poultry raising and codfish curing. It has a bank, newspaper, a four-year high school and several churches. Transportation is by Sound steamers to Bremerton and Seattle.

Tracytown: A farming center of about 250 people located on Washington bay, three miles north of Bremerton, where many of the men work. School and church facilities are sufficient. Steamers make daily trips to Seattle.

Winslow: A small town on the east side of Bainbridge island, devoted to shipbuilding, dairying and truck gardening. It has two churches, good school, and a small public library. Steamers make regular trips to Seattle.

PIERCE COUNTY.

This county ranks second in western Washington in population, wealth and business importance. It is penetrated by the upper reaches of Puget Sound, and is nearly central to western Washington.

Natural Features: A larger variety of unusual physical features and a greater range of elevation than any other county in the United States are among its distinguishing characteristics. It lies on both sides of the Sound and includes a number of medium-sized islands. These islands and the westside mainlands are principally rolling uplands, suitable for agriculture.

The eastside mainland comprises more than nine-tenths of the county and contains the bulk of its wealth and population. Starting from sea level on the west it rises gradually by a series of plains, plateaus and foothills, to the heights of the snow-capped Cascades in the eastern extremity but is lifted far above the other sections of the range by the commanding eminence of Mt. Rainier (or Mt. Tacoma) 14,408 feet, the second highest peak in the United States outside of Alaska. This snow-capped and deeply glaciated monarch is the central figure in Rainier National Park, which comprises 320 square miles of magnificent mountain scenery and is recognized as one of the greatest tourist meccas in the entire West.

The northern and northeast extremity of the county are drained by the White river. The Puyallup and its main tributaries, the Carbon and Stuck, drain most of the eastern and north-central parts, and the Nisqually, forming the southern boundary, drains the southern and extreme southeastern sections. The Puyallup valley is one of the richest agricultural valleys in the Northwest. It reaches from 25 or 30 miles into the interior and is from a half to five miles in width. The lower part becomes a section of the main thorofare between Seattle and Tacoma and is followed by the trunk railroads and the Pacific Highway.

Most of the western townships lying between the Puyallup and Nisqually valleys, south of Tacoma, are occupied by expansive stretches

of level to slightly rolling gravelly prairies, well drained, thinly wooded with small oaks, and carpeted in spring with a large variety of wild flowers, much like the moors of southern England or the plains of Normandy. Numerous pretty lakes dot the surface, a number of which have been made into summer resorts. Here and there are a few higher ridges covered with merchantable timber; further east the timbered foothills soon reach the rougher mountainous region.

Soil: The richest soils of importance are the silt loams of the extensive Puyallup and White river valleys and the Buckley loam, composed largely of silt and clay occupying the adjacent plateau in the north and extending into King county. The valley lands are for the most part alluvial, enriched with decayed vegetation, silted from the forests above. Their depth is from a foot to 20 feet with usually a clay or sandy subsoil. Hardpan is seldom encountered. Other patches of rich silty soils occur along the Nisqually river and near other small streams and lakes while isolated patches of peat and muck area are found scattered throughout the region. Some tidal marsh is found near the salt water.

The prairies are generally loams with sand and gravel prevailing but with considerable organic matter near the surface. Their principal drawback for extensive farming is their failure to hold sufficient moisture.

Adjacent to the prairie are other loams with various quantities of gravel, sand, clay and stone, which properly cultivated are well suited for berries, fruits and dairying. Much of this is now in the logged-off state or covered with timber.

Climate: The climate is comparable in mildness with the south of England, except that there is less snow and a smaller range of temperature. The western half of the county lies in a zone which receives an annual rainfall of from 30 to 50 inches. The United States weather bureau station at Tacoma reports the average annual precipitation for a period of 17 years as 42.27 inches, of which 25 inches fall between December 1st and March 1st. The annual mean temperature is 50.6. The mean monthly temperature for January, the coldest month, is 39 degrees, and for July, the warmest month, 63.3 degrees. The mean maximum for July is 73.2, and the mean minimum for January, 34.3 degrees. Average date for last killing frost is March 14th, and first in fall November 19th. Prevailing winds are from southwest. Temperature varies little from year to year.

Population: The census of 1910 recorded a population for the county of 120,812, representing the remarkable increase of 117.6 per cent over the figure given 10 years before. A big growth is still continuing especially in the city of Tacoma and several of the other incorporated cities. The total recorded by the 1920 census was 144,127, an increase of about 11 per cent.

Lands: The total land area is 1,088,640 acres, only 605,000 acres of which, exclusive of town and city lots, are at present on the county tax rolls. Of the remainder, 207,360 acres are in Rainier National Park; 149,914 acres are in the Rainier National Forest Reserve; 56,000 acres described as "mountainous and rocky," are open to entry at the United States Land Office; 17,463 are included in the Puyallup Indian reservation; about 2,000 acres are in the Nisqually Indian reservation; and 33,239 are state lands.

Of the private lands, 156,590 acres are in farms, 50,000 are improved, nearly 300,000 are still covered with virgin timber and the remainder is logged-off or burnt-off or unimproved prairie land. About 87,000 acres of additional land can be subjected to cultivation when cleared and about 350,000 acres outside the reserve will be valuable for grazing.

Prices of Land: A wide range of prices prevail, generally dependent upon location, transportation facilities, and the use to which land may be put. Unimproved agricultural land above the valleys and principally logged-off, but with productive soil, sells all the way from $5 to $150 an acre. Such lands cleared will run from $100 to $250 per acre. Improved river bottom land or first bench lands of the White, Stuck, Puyallup and Nisqually rivers, and of the Ohop, Muck and Clover creek valleys, which have proved their intense value for hops, berries and other fruit culture, will range between $250 and $600 an acre, excep-

tional pieces in the Puyallup valley going as high as $1,000. For the ordinary family five to twenty acres of such land will be plenty.

Resources and Industries: The natural resources of the region are similar to other Puget Sound counties, but a strategic location as to water and rail transportation and accessibility to other parts of the state has enabled it to benefit in an extraordinary degree. Agriculture, lumbering, shipbuilding, mining, fisheries, water power, manufacturing and commerce have all contributed liberal proportions toward a total valuation for the county of $197,841,264.

Agricultural Pursuits: Among agricultural pursuits, berry culture, hop growing, truck gardening, poultry and dairying are of greatest importance. The valley lands are ideal for intensive cultivation and all sections are excellent for poultry and dairying. In berry culture the Puyallup valley sets the pace for the Northwest, and the county is one of the leading poultry counties in the state. In 1918, there were about 3,500 cows and six creameries, which manufactured 900,000 pounds of butter, worth $400,000. Milk and cream returns amounted to $700,000. The county has about 75,180 apple trees, 20,160 pear trees, 6,210 plum and prune trees, 9,000 cherry trees and over 2,000 acres devoted to raspberries, blackberries, strawberries and loganberries.

Lumbering and Shipbuilding: Possession of, and proximity to, additional heavy forests of fir, cedar and spruce, have been responsible for big lumber enterprises which have netted the county millions of dollars. There yet remain in the county 300,000 acres of privately owned virgin timber, 150,000 acres within the reserve, and considerable on state land. This should represent in the neighborhood of 12 billion feet of timber yet standing in the county. At the present time over a billion feet of timber is cut each year, which gives employment to about 5,000 men and represents a capital of about $15,000,000. There are also many shingles produced, over 200 million annually in the city of Tacoma alone, with probably an equal number in the rest of the county.

On account of the excellent harbor facilities and proximity to the necessary raw materials, the section became, during the war period, one of the most important in the building of wooden and steel ships. The industry has now become permanent, one of the largest steel shipbuilding plants being located at Tacoma.

Mining: Mining is principally for coal. During the year 1918, seven large mines, employing 1,238 men, were in operation and produced over 600,000 tons of coal and about 94,000 tons of coke. Some copper and a little gold and silver have been mined, but not in paying quantities. Considerable clay and sandstone and some granite have also been found. Although the output of precious metal is negligible in the county itself, the rich ores from miles around are brought to the big smelter at Tacoma, where $40,000,000 worth of ore is worked annually, including one-twelfth of the copper output of the United States.

Fisheries: The fishing industry is represented by a large fleet of halibut and salmon fishing vessels operating out from Tacoma in the waters of Puget Sound and the northern seas. As high as 1,000,000 pounds of halibut have been handled in one year over the Tacoma wharves.

Water Power and Manufacturing: Several large hydro-electric power plants are operated, representing 100,000 horsepower, while the amount of water power still running free is unlimited. Such a resource and the resulting cheap power has been partially responsible for a rapid growth in manufacturing and promises much for the future. The leading enterprises are such as depend on timber. Furniture factories, sashes and doors, boxes, broom handles, flour and meal, foundry and machine shop products, artificial stone products, cannery and other food products are among the leading manufactures. In flour output this county leads the rest of the state, Tacoma being the headquarters for the largest milling concern west of Minneapolis.

Commerce: On account of a strategic geographical position and excellent transportation facilities, this county too has reached an important position in commercial and financial matters. Some of the strongest banks in the West are located in Tacoma, which does business with

every part of the world, including the Orient, Australia, South America and Europe. The total value of all imports and exports for the port of Tacoma runs high in the millions each year. Bank deposits of the county's 14 banks are about $45,000,000.

Markets: The proximity of Tacoma with its population of about 100,000 and the transportation facilities afforded make easy the disposition of all farm and garden outputs. In fact, large quantities of forage, seed, fruits, dairy and other animal products must be brought in from eastern or southwest Washington. The lumber, shingles, flour and meat products are shipped to all parts of the world.

Transportation and Highways: Four great transcontinental lines, viz., the Great Northern, the Northern Pacific, and the Chicago, Milwaukee & St. Paul railways and the Oregon-Washington Railroad & Navigation Company, or Union Pacific, give direct rail service, and connections are made with the Canadian Pacific and the Chicago Great Western. The Northern Pacific and Chicago, Milwaukee & St. Paul have their terminals in Tacoma where they maintain shops and large ocean docks and wharves. In addition, the Puget Sound Electric supplies hourly service to Seattle, and other lines render frequent service to Puyallup, Spanaway and American Lake. There are altogether in the county about 502 miles of steam railway and 153 miles of electric trackage including the city lines of Tacoma.

Special steamers render bi-hourly service to Seattle and regular daily steamers run to the various islands and serve all Puget Sound cities and landings. Special ferry service has just been established between Tacoma and Vashon Island. Ocean-going vessels leave for foreign ports including Mexico, South America, Hawaii, Australia, Siberia, Oriental and European ports.

There are about 1,700 miles of highway, the principal sections of which are paved and the remainder is hard-surfaced with well packed gravel and crushed rock. Various stage lines with established schedules operate over these roads the year round, giving frequent service out of Tacoma, which is the national headquarters for the Evergreen Highway Association, to all the surrounding towns. Stages also leave for Seattle, Olympia and Aberdeen.

Social and Educational: The county enjoys with King every modern advantage in social, educational, religious and professional activities. In addition to educational institutions, churches, libraries, parks, hotels, playgrounds and boulevards have been placed where they can be enjoyed to the fullest advantage. As in King, all institutions are representative of the West at its best and are modern in architectural design and finish. The county is divided into 112 school districts and 19 high school districts. Fifteen private schools, including several of state prominence are maintained. There are 27 newspapers published, 21 women's clubs are in good standing, and every fraternal organization is represented. Mail service is rendered by 65 postoffices and 16 rural routes. There are also 65,062 miles of telephone wire and 821 miles of telegraph wire.

Other important institutions include the Western Washington Experiment Station at Puyallup, the State Historical Society at Tacoma, the State Soldiers' Home at Orting, and the Camp Lewis cantonment, just south of Tacoma. Tacoma is visited by every high class entertainment that comes to the Northwest, and can be reached in less than an hour by practically all the people in the county. Of unusual interest are the yearly automobile races on a two-mile track near this city, and people are attracted from all parts of the West. Racers of national reputation contest and world's records are made.

CITIES AND TOWNS.

Alder: Elevation 1,147 feet. A logging and farming center on the Tacoma Eastern railway, a branch of the Chicago, Milwaukee & St. Paul, near the Nisqually river, 41 miles southeast of Tacoma. It has a shingle mill, a four-year high school and a church.

Ashford: Elevation 1,771 feet. A village located at the terminus of the Tacoma Eastern railway and the nearest railroad point to Rainier National Park. Two shingle mills and a sawmill are just outside the townsite. A high school and church is

supported. Stages run from here into the park, also to Seattle and Tacoma.

Buckley: Altitude 773 feet. Population 1910, 1,272. Census of 1920, 1,119. Situated in the center of a rich plateau, near the White river, on the Northern Pacific railway, 30 miles southeast of Tacoma. Farming, mining and lumbering are the sustaining industries. Berries, hops, and vegetables do well and several active coal mines and sawmills are in the vicinity. It has a bank, weekly newspaper, a four-year high school, public library, park, four churches, paved streets and walks, electric lights and municipal water plant. Stages run to Tacoma and Seattle.

Burnett: Elevation 517 feet. A coal mining center of about 400 people, located on the Northern Pacific railway, 29 miles southeast of Tacoma. About 300 are employed in the coal mines and 125,000 tons of coal are produced annually. Stages run to Seattle and Tacoma.

Camp Lewis: When this country declared war on Germany, it accepted as a gift from Pierce county 76,000 acres of land adjacent to Tacoma on the south, and established there its largest permanent army mobilization and training cantonment and named it Camp Lewis. This cantonment was built at a cost of $6,864,000. It contains 2,100 cantonment buildings, a base hospital which with equipment cost $1,500,000, 26 miles of good street and 65 miles of sewer and water pipes, besides big amusement and social structures built by the different war service agencies, and all the usual business concerns of a city. Recruits were brought here from all the western states and moulded into the famous 91st Division, which was among the first to go to France, where it won world renown on the famous battlefields. The 13th Division was also trained here.

Carbonado: Altitude 1,146 feet. A coal mining town of about 1,000 people, on the Northern Pacific railroad, 34 miles southeast of Tacoma. About 200,000 tons of coal are mined annually. Electric lights, good water, one church and a two-year high school are enjoyed.

Dieringer: Elevation 75 feet. A community of about 100 people on the Northern Pacific and Great Northern railways, three miles north of Sumner. It is the site of the Puget Sound Traction, Light & Power Company's hydro-electric power station, which supplies power to all the Sound country, including the Chicago, Milwaukee & St. Paul railroad. The adjacent land is excellent for five-acre tracts. Electric lights and the best of water is supplied.

Dupont: Altitude 243 feet. A company town of 600 people, located on the Northern Pacific railroad and Pacific Highway, 18 miles southwest of Tacoma. Practically the only industry is one of the large powder plants of the E. I. Du Pont de Nemours Powder Company, employing about 200 men. Town has two stores, butcher shop, large hotel and garage. Church and school facilities are ample.

Eatonville: Elevation 800 feet. Population 1910, 754. Census of 1920, 861. Located on the Chicago, Milwaukee & St. Paul railway in the basin of the Mashelle river, 33 miles southeast of Tacoma. Lumbering was originally the only industry but it is now supplemented with dairying and general farming. A sawmill employing 250 men and an ice cream plant is operated. Minerals and water power will influence future growth. City owns its transmission lines bringing light and power from La Grande. Among important institutions are a bank, hospital, two garages, a dairy, weekly newspaper, two churches, and three school buildings, including a $45,000 high school which makes a specialty of manual training, home economics, agriculture, commercial courses, music and art and athletics.

Elbe: Altitude 1,210 feet. A lumber and agricultural center of 150 people, on the Tacoma Eastern railway, 47 miles southeast of Tacoma. It has two churches, a large saw and shingle mill and a four-year high school.

Fairfax: Elevation 1,350 feet. A mining town of about 400 people located on the Carbon river, at the terminus of the Fairfax branch of the Northern Pacific railway, 40 miles northwest of Tacoma. This is also one of the starting points for Mt. Rainier. About 40,000 tons of coal are produced annually and much

lumber is cut. School facilities are provided.

Fort Steilacoom: A postoffice 12 miles southwest of Tacoma, and the home of the Western Washington State Hospital for the Insane. In territorial days this was the site of a fort to protect against the Indians.

Gertrude: A village of about 300, located on a well sheltered bay of McNeils Island, 16 miles southwest of Tacoma. Surrounding country is good for fruit and berries. A box factory and a sawmill are operated. Church and school facilities are provided.

Gig Harbor: A town of several hundred people, located on harbor of same name, eight miles northwest of Tacoma, and devoted to fishing, lumbering and shipbuilding. A shipyard, sawmill and sheet metal works are operated. It has a newspaper, four churches, a high school and three fraternities.

Kapowsin: Altitude 630 feet. A town of about 400 population, on the Chicago, Milwaukee & St. Paul railroad and Lake Kapowsin, 23 miles southeast of Tacoma and three miles from the Stone-Webster power plant. Lumber and shingle manufacturing are the main industries but the beautiful setting amidst a dozen pretty lakes attracts many pleasure seekers, some of whom make this the starting point for Mt. Rainier. A four-year high school, church and electric lights are provided.

Lakeview: Altitude 277 feet. A town of about 200 people on the Northern Pacific railway and Pacific Highway, eight miles south of Tacoma. Dairying and poultry raising are carried on in vicinity. It has one church and a grade school.

McKenna: A town of about 450 people, located on the Chicago, Milwaukee & St. Paul railroad, 25 miles southeast of Tacoma. The chief industry is a large sawmill employing 350 men. Adjacent lands, suitable for intensified farming and irrigation are being offered in 10-acre tracts on easy terms.

Milton: Population 1920, 484. A logging and lumbering town located on the Puget Sound Electric railway, six miles east of Tacoma, which city it serves as a residence suburb. People specialize in berries and truck gardening.

Cranberry picking in Pacific County.

National: Altitude 1,590 feet. A saw and shingle mill town, on the Chicago, Milwaukee & St. Paul railway and Nisqually river, 53 miles southeast of Tacoma.

Orting: Altitude 198 feet. Population 1910, 799; 1920 census, 972. Situated on the Northern Pacific railway in the Puyallup valley, 18 miles southeast of Tacoma. The State Soldiers' Home nearby is not counted in the population. Dairying, general farming, hops, berries and ginseng are successful enterprises. A shingle mill, sawmill and cheese factory are operated and a bank, picture show, four churches, four-year high school, electric lights and paved streets are maintained.

Puyallup: Elevation 49 feet. Population 1910, 4,969; 1920 census report, 6,323. Located on the Great Northern, Northern Pacific, Oregon-Washington and Chicago, Milwaukee & St. Paul railways, nine miles southeast of Tacoma in the heart of the Puyallup valley, famous as one of the most important berry sections on the Coast. It is the second city in size and importance in the county and maintains one of the largest modern fruit canneries on the Pacific Coast. Surrounding lands are divided into small tracts devoted principally to berry culture and dairying. Two box factories and several sawmills, a shingle mill and creamery are also located here. It has two banks, a four-year high school, three grade schools, eight churches, two weekly newspapers, a Carnegie library, the State Masonic Home and the G. A. R. Ladies' Home Sanitarium. The Western Washington Experiment Station is located here and the Puyallup fair is held each fall. It enjoys paved streets, cement walks, electric and gas lighting and gravity water supply. Electric cars run to Tacoma and stages to all the neighboring cities and towns.

Roy: Altitude 315 feet. Population 1920, 287. A trading point on three trunk railways, in the Muck Creek valley, 19 miles south of Tacoma. It has a bank, sawmills, four-year high school and one church. Rich farm land surrounds it.

Ruston: Population 1920, 1,128. Although separately incorporated this city is practically a part of Tacoma, by which it is surrounded and whose conveniences and general utilities it shares. Its main industry is the Tacoma smelter, one of the biggest in the West.

South Prairie: A farming center, located on the Northern Pacific railway, 25 miles southeast of Tacoma Much undeveloped coal and clay is in vicinity. Two churches and a grade school are provided.

Spanaway: A town of about 300 population, located on the prairie by Spanaway lake, 10 miles south of Tacoma. It is served by electric interurban. Poultry and dairying are leading industries. It has three churches, grade school and public park.

Steilacoom: Population 1910, 420; 1920 census, 564. Located on the Oregon-Washington, Northern Pacific and Tacoma Railway & Power Company railways, 12 miles southwest of Tacoma. It is one of the oldest settlements on the Coast and is prettily situated commanding a magnificent view of the Sound. Good garden land is in the immediate vicinity and cherries and berries do well. About a mile from the town a $600,000 paper mill has recently been completed, and a little further off a big furniture factory operates. It has three churches, a large Masonic building, several stores, electric lights, excellent water and a good school. Stages run to Tacoma.

Sumner: Altitude 72 feet. Population 1910, 892; 1920 census, 1,499. Situated at the confluence of the Stuck and Puyallup rivers, on the Northern Pacific, Great Northern and Chicago, Milwaukee & St. Paul railways, and the Pacific Highway, 12 miles southeast of Tacoma. The same rich berry lands which have made Puyallup famous are tributary and the same cooperative company maintains a large modern cannery in each city. Sumner is also the home of the Northwest Fleishman Yeast Company, the Northern Board and Paper Mills, and of a plant manufacturing silos for the rapidly increasing dairying business. It has a planing mill, a bank, four-year high school, four churches, weekly newspaper, municipal water, paved streets and electric lights. Stages operate to Seattle, Tacoma and neighboring cities.

Tacoma: County seat. Altitude, sea level to 213 feet. Population 1910, 83,743; 1920, 96,965. Area in incorporated limits 39½ square miles. Actual value of taxable property $114,002,580. Tacoma is one of the three leading cities in the state. It occupies and extends beyond a sightly V-shaped peninsula pointing to the north and separating the main channel of the Sound on the west from Commencement Bay, one of the greatest harbors laving its northeastern boundary. Facing this bay on the south are extensive tide flats, which, with a narrow strip along the bay's western edge, is occupied by manufacturing plants, railroads, deep water wharves and warehouses. Directly above to the west the business section rises by terraces to the higher altitudes and gradually blends with the beautiful homes,

parks and boulevards occupying the remainder of the peninsula. From almost any point in the city one catches a view of the island-dotted Sound and the forested mainlands rising gradually to the foothills of snow-capped mountain ranges, crowned by Mt. Rainier (or Mt. Tacoma) beyond.

Plans for important port extensions are under way, $2,500,000 worth of bonds having been voted by the county. The city already has 14 miles of harbor waterfront and two miles of wharves, and is served by six foreign, four coastwise, and eight local steamship lines, including large palatial steamers making bihourly trips to Seattle. Direct service is provided by the Northern Pacific, Chicago, Milwaukee & St. Paul, Oregon-Washington and Great Northern railroad companies, the first two of which have their shops and terminals here; and connections are made with the Canadian Pacific and Great Western. Recent railroad improvements include a $3,000,000 tunnel under the city and an expensive modern depot. Two electric interurbans give hourly service to Seattle and Puyallup, and 95 miles of electric rail are operated in the city limits.

Tacoma is preeminently a manufacturing city, but extensive coal mines, and timber lands, fisheries, agriculture and strategic location have all played important parts in making it one of the leading cities in the Northwest. In 1914, $28,287,257 was invested in 339 manufacturing establishments, which employed over 8,000 persons and turned out products valued at $27,707,606. In 1918, according to estimates by the Chamber of Commerce, all manufactures including shipbuilding amounted to $150,000,000. Next to shipbuilding, the leading enterprises are ore smelting, meat packing, lumbering, shingle weaving and the making of furniture, sashes and doors and miscellaneous woodenware. Other important manufactures include iron, copper and tin products; marble and stone articles; printing and publishing; clothing and rubber goods; confectionery, bread and bakery products; canned goods, and dozens of other miscellaneous articles.

As a grain center, Tacoma leads the Northwest. The daily output of the flour mills is 9,000 barrels. Total for the year 1918 amounted to 2,160,474 barrels, valued at $22,747,551. Total wheat received for the year amounted to over 6,322 cars. Its jobing business in 1918 was about $160,000,000, and its retail trade was estimated at $65,000,000. It is one of the five largest shipping ports on the American Pacific Coast. Exports for the year 1919 amounted to $130,720,014 and imports to $120,624,229, or a total of $251,344,343.

Bank clearings of its eight banks for 1918 were $243,972,548.16. Total deposits amounted to $38,139,781.17. Postal receipts were $678,538.54. Building operations amounted to $2,844,490.

Among the most noteworthy features of the city is a great amphitheater or stadium built to conform with a monster ravine overlooking the Sound; this cost $135,000 ten years ago and contains 29 miles of concrete seat tiers with a seating capacity of 38,000 people. City also owns an hydro-electric plant, costing $2,000,000, a gravity water system costing $2,250,000, two high steel lift bridges and several modern fire stations. It has 111 miles of paved street, 408 miles of concrete walks, 224 miles of sanitary sewer, 340 miles of storm sewer, 284 miles of water mains, three reservoirs and three standpipes, with total capacity of 129 million gallons.

Educational and religious institutions include three large high schools, 32 grade schools; 11 private schools, including three parochial schools and eight colleges and academies; a Y. M. C. A.; a Y. W. C. A.; a public library of 85,598 volumes; three daily and eight weekly papers; and six monthly periodicals.

Wilkeson: Altitude 851 feet. Population 1920, 803. Located on a branch of the Northern Pacific railway, 23 miles southeast of Tacoma. It is a trading center for an extensive coal mining region. Coke ovens are also maintained. Coke and coal output in 1918 amounted to about 150,000 tons. A sandstone quarry is also nearby. The city has a bank, two schoolhouses, three churches, electric lights, good water, and a volunteer fire department.

THURSTON COUNTY.

This is one of the oldest settled communities in Western Washington. It lies between Pierce county on the east and Grays Harbor county on the west, and its northern townships are penetrated by the upper reaches of Puget Sound.

Topography: A comparatively level prairie region extending from the northeast to the southwest makes up most of its surface. Toward the north this prairie joins with some gently rolling glacial uplands which merge with the Black Hills along the western boundary line. A gently rolling to hilly country occupies the extreme southern townships which become rougher and more hilly as the mountainous region of the extreme southeast is approached. The principal streams are the Black river in the west, the Deschutes, draining the central and southeast areas into the Sound, the Nisqually, marking the eastern boundary line, and the Skookumchuck and Chehalis rivers in the extreme south. Many small lakes dot the surface and the several arms of the Sound cutting in from the north give the county a waterfront of about 100 miles.

Soil: The soil includes silty loams and rich black alder bottoms in the lowest altitudes, clay loams on the rolling logged-off areas, and sandy or gravelly loams on the level prairies. Some peat beds, cranberry bogs, and deep muck are also found in scattered localities. For general cultivation, oats, rye, wheat, vetch, corn, potatoes and other root crops do well; but in many places, pears, apples and berries and hops are particularly successful.

Climate: The annual precipitation is for most parts of the county between 40 and 60 inches, about 80 per cent of which occurs between November 1st and April 1st. Very little snow falls and the growing period lasts about 188 days. Hurricanes, tornadoes, and blizzards are unknown. The mean annual temperature at Olympia is about 50 degrees; the mean monthly maximum, 77 degrees; and lowest mean monthly minimum, 33.3 degrees. Outdoor labor is scarcely interfered with at any time of the year.

Population: The 1910 census credited the county with a population of 17,581, representing an increase of 76 per cent in ten years. The 1920 census recorded 22,366. Probably a third are foreign-born, chiefly Germans, Scandinavians and Canadians. More than a third live in Olympia, the state capital and county seat.

Lands: The total land area consists of 457,760 acres, of which 18,422 acres are state lands and all the remainder, except about 2,000 acres included in the Nisqually Indian reservation and 320 acres in the Olympic Forest Reserve, has passed into private ownership. Less than 30,000 acres including some tide flats have been improved, but about 16,000 acres including prairie and cut-over land are fenced. Nearly 150,000 acres are still covered with timber. It is estimated that ultimately three-fifths of the entire county can be put under the plow and that the remainder will be suitable for grazing.

Prices of Land: Rough cut-over lands suitable for grazing only may be bought as cheap as $5 per acre. If suitable for ultimate cultivation the most desirable will go as high as $75 or $100 per acre. Land that is fenced, cleared and under the plow may be bought for from $75 to $200 an acre. Prairie lands are worth from $20 to $100. Opportunities for leasing are frequent.

Resources and Industries: The varied resources permit the successful prosecution of nearly all leading industries in this county. Much lumber is manufactured and will be for many years; the remaining stand of privately owned timber amounts to about 3,324,756,000 feet, to which should be added over a billion feet on the state lands. Many shingle mills and miscellaneous woodworking plants are also operated. Cheap power is available from the Deschutes, Nisqually and Skookumchuck rivers.

Agricultural enterprises are gradually increasing in importance. Of these, dairying and stock raising take the lead, there being five creameries, about 5,000 milch cows and an equal number of stock cattle in the county, besides many horses, sheep and hogs.

Other crops include about 250,000 bushels of potatoes, 150,000 bushels of oats and a little wheat and bar-

ley. The progress in horticulture is shown by the presence of about 40,000 apple trees, 7,000 pear trees, 6,000 plum and prune trees and 3,500 cherry trees. Berries of all kinds grow profusely in this county and many acres in the vicinity of Olympia are now being planted to loganberries which have been proven especially profitable.

The fishing industry is carried on chiefly for oysters, in which respect Thurston ranks first in the state. Over two million pounds of shell fish, including native and transplanted oysters, clams and shrimps, were shipped out of Olympa in one year by one express company.

The principal paying mineral resource is coal. Mines are operated at Tono and Bucoda with a total annual output of over 200,000 tons. Large bodies of commercial building stone exist and several quarries are in operation.

Transportation and Highways: This county is favored with about 220 miles of steam road, six miles of electric railway, about 700 miles of highway and 100 miles of salt water frontage. The steam railroad mileage is supplied by the Northern Pacific and Chicago, Milwaukee & St. Paul, but the main line of the Northern Pacific railway is used jointly by the Great Northern and Oregon-Washington Railroad & Navigation Company. Nearly all postoffices are on one or more of these lines, while Olympia and Tenino are served as well by six miles of electric road.

The Pacific Highway and the Olympic Highway, two of the leading state roads, pass through Olympia and connect with other hard-surfaced roads extending to the various towns and agricultural communities. The Pacific Highway is paved from Olympia to Tacoma and part of the distance to Tenino. Present plans call for much additional cement paving. Trucks and stages operate between Olympia and Tacoma, Shelton, Tenino, Centralia and Aberdeen. Steamboat travel is now confined chiefly to freight and island passenger service.

Social Conditions: The location of the state capital in this county tends to create a cosmopolitan social atmosphere, bringing as it does all classes of distinguished people to the district. A general prosperity is attested by the ornate homes, the well-kept ranches, substantial public buildings and the numerous automobiles. Eight newspapers are published, churches and fraternities are maintained in the towns, and grange associations exist in all the farming districts. Art, music and literature are encouraged by all classes. The county has 60 school districts, eight high school districts, two private schools, 19 postoffices and 10 rural routes.

CITIES AND TOWNS.

Bordeaux: A saw and shingle mill town of about 300 population, 16 miles southwest of Olympia. A logging railroad connects it with the Northern Pacific line near Little Rock. About 175 men are employed at the mills in town and 425 in the logging camps adjacent.

Bucoda: Elevation 254 feet. Population 1920, 442. A logging and coal mining town located on three transcontinental railroads, 18 miles south of Olympia. It has a sawmill and good school and church facilities.

Gate: An important railway junction point for Grays Harbor and Portland trains, 19 miles southwest of Olympia. Logging, lumbering and farming are carried on in vicinity. Population of community is about 200.

Independence: A logging and dairy center of about 200 people, located at the junction of the Chicago, Milwaukee & St. Paul, and Northern Pacific railways, 20 miles south of Olympia.

Lacey: Elevation 184 feet. A town of about 500 people, located on the Grays Harbor branch of the Northern Pacific railway, five miles east of Olympia. It has a lumber and shingle mill, a public school and St. Martin's College for boys. Good agricultural land surrounds it.

Little Rock: Altitude 138 feet. A shingle mill town of about 300 people, on the Northern Pacific railway, 12 miles southwest of Olympia. Three churches and a four-year high school are maintained.

Olympia: State capital and county seat. Area 7½ square miles. Population 1910, 6,996; 1920 census, 8,537. Located on the Northern Pacific and Oregon-Washington railroads at the southern extremity of Budds Inlet, the most southern arm of Puget Sound. Steamers run to

Shelton, Tacoma and Seattle, and numerous small craft to the small farming communities of the islands and mainland. In addition, auto stages leave every hour for Tacoma and several times daily for Shelton, Tenino, Centralia and Aberdeen. The city is surrounded by natural beauty which is now being embellished by the expenditure of several million dollars in new capitol buildings. A 155-room hotel, a four-story Elks' building and various other business structures have just been completed.

Olympia is the main trading center for a large agricultural area; it is adjacent to the most valuable oyster beds in the state and possesses a number of important manufacturing plants. Its local industries include two creameries, a fruit cannery, oyster and shrimp cannery, knitting mills, machine shops and foundries, shipyards, saw and shingle mills, sash and door factory, extract manufacturing concern, a bottling works, several steam laundries and the plant of the state printer. During the war it was one of the leading wooden shipbuilding points in the state. It has two daily and three weekly papers, a new modern high school, five grade schools, Providence academy, St. Peters hospital, a large federal building, and four public libraries, viz.: The state library, state law library, state traveling library, and a city Carnegie library. The city enjoys as well ten miles of paved streets, cement walks, six miles of electric railway, municipal water system, a paid fire department with most modern equipment, and a city park of 256 acres with all conveniences for tourist camping parties.

Rainier: A town of about 250 people, devoted to lumbering and general farming, on the N. P. and C., M. & St. P. railways, 22 miles southeast of Olympia. A high school and two churches are maintained.

Rochester: Altitude 150 feet. An agricultural and dairying center at the junction of the N. P. and C., M. & St. P. railroads, 22 miles south of Olympia. It has a high school and three churches.

Tenino: Population 1920, 850. Located on the N. P., G. N. and O.-W. railways, two miles from the C., M. & St. P., 16 miles south of Olympia, in a pretty prairie valley, devoted to dairying. It is the second city of importance in the county and is noted for its excellent building stone quarries, but has also sawmills and other woodworking factories and a creamery. A bank, newspaper, three churches and a four-year high school are maintained. City enjoys a splendid water supply, electric lights and paved business streets.

Tono: A coal mining town of several hundred people, 20 miles south of Olympia, and served by a special branch of the Oregon-Washington railway extended from Centralia. A big coal mine is operated here and good school facilities are provided.

Tumwater: Population 1920, 472. This is the oldest settlement on Puget Sound. It is located at the mouth of the Deschutes river, on the Oregon-Washington railway, and adjoins the southern limits of Olympia. Agricultural lands are adjacent on the south and timber lands toward the west. Tumwater Falls, close to the business section, have been harnessed to provide power and lights for the city of Olympia. In addition to the usual local businesses it has a shingle mill, shipyard, a fruit products plant and a cold storage plant. Good church and school facilities are provided. Electric cars run to Olympia.

Union Mills: The home of a big lumber mill, six miles east of Olympia, on the Northern Pacific railway. Population is about 300. A Presbyterian mission is maintained.

Yelm: An agricultural center of about 300 population, located in the center of Yelm prairie, 20 miles southeast of Olympia, on the Northern Pacific, Great Northern, and Oregon-Washington railways. About 6,000 acres of fertile land are being reclaimed by an irrigation ditch bringing water from the Nisqually river. Timber comes to the edge of prairie and supports a number of saw and shingle mills in vicinity. Good irrigated lands can be bought cheap. A creamery, a four-year high school, two churches, garage, and blacksmith shop are maintained and all mercantile lines are represented. Stages run to Tacoma.

Olympic Peninsula.

MASON COUNTY.

Mason county comprises the southeastern corner of the Olympic peninsula and several islands, the largest of which is Hartstein, about nine miles long and three miles wide. It has been somewhat slow in the past to attract settlers, on account of remoteness from the main traveled thoroughfares and the lack of railroads, but conditions are rapidly changing with the building of state highways and the increased importance of motor traffic.

Natural Features: Hoods Canal, cutting in from the northeast, penetrates to the center and, bending back in almost the same general direction, carves a hook-shaped waterway in the county and all but connects with the upper reaches of Puget Sound, forming the southeastern boundary. Near these waterways the surface is quite rolling, but toward the west and northwest it gradually becomes more choppy and broken and soon merges with the foothills of the Olympic mountains. The Black Hills appear along its southern boundary. A number of beautiful lakes, including Lake Cushman, a famous summer resort, add to the beauties of the interior region, while the Skokomish river and several other shorter streams have cut deep canyons in the hills and created some level valleys containing good agricultural land. All the surface was once covered with heavy timber, but about 40 per cent is now logged-off.

Population: In 1910 the county contained 5,156 people, or one person for every 115 acres of land area. The 1920 census recorded 4,919, or one for every 121 acres of land. Among the foreign-born are a large number of Finns, Scandinavians and Canadians, and a few of nearly every other nationality. Shelton is the largest city.

Lands: Total area of the county is 930 square miles, or 595,200 acres. Of this, 162,078 acres are in the forest reserve, 9,297 acres are in Indian reservations, and 37,458 acres are state lands subject to purchase. Practically all the remainder has passed into private ownership and includes 15,000 acres of timber, 25,000 acres logged-off or burnt-over and 10,000 acres improved.

Soil: In the valleys, the soil is usually a deep rich alluvial loam, exceptionally rich in lime content and sufficiently provided with the other important elements. On the uplands the predominating soils are a shot clay of from six inches to three feet or more in depth and several varieties of gravelly loams, well adapted to tree fruits and grasses. Root crops and grains are particularly successful crops throughout the region.

Climate: Nature's artful distribution of mountainous and water areas is responsible for a delightfully equable climate, a varied vegetation and many health resorts and camping and hunting grounds. The annual precipitation is about 60 inches in the valleys but considerable more in the mountainous regions. The growing season is about 175 days.

Prices of Land: Improved hay lands are worth from $75 to $200 per acre; grain lands, from $100 to $200; and lands suitable for general farming, from $50 to $200. Unimproved agricultural lands sell for between $50 and $100 and lands suitable for grazing only fetch from $2.50 to $5.00.

Resources and Industries: Among the principal established industries are the timber pursuits, fisheries, dairying, poultry raising and stock raising. The fisheries include oyster culture, which has here reached its greatest importance in the state. There are also about 7,300 apple trees, 1,200 pear trees, 1,000 plum and prune trees, 1,100 cherry trees, 425 peach trees, and about 100 acres of grapes and berries. The grapes

grown on Hartstein Island are unsurpassed for flavor and sweetness and are famous throughout the West. Vast water power may be developed in the Skokomish river and Lilliwaup creek.

Transportation and Highways: Steamboat transportation brings the Sound and Canal landings in daily communication with the large cities on the Sound. A spur of the Northern Pacific railway enters the county on the south and several logging roads penetrate the timbered recesses of the interior, carrying the products to the main line or to the waterfront. Good automobile roads connect the little towns and pleasure resorts with the Olympic Highway, which follows the west shore of Hoods Canal and joins Shelton with Olympia and Grays Harbor.

Social Conditions: Outside the county seat, it may be said that most of the really social functions center around the summer resorts which attract many summer campers, who delight in this region on account of the exceptional hunting and fishing advantages. School and church facilities are located where needed, there being 36 school districts and three high schools. The latter are located at Hoballa, Oyster Bay and Shelton. Mail is distributed by 18 postoffices and two rural routes. There are 362 miles of telephone wire.

CITIES AND TOWNS.

Potlatch: A logging town on Hoods Canal, employing about 300 men. It has two churches and good school facilities. Transportation is by boat and automobile.

Shelton: County seat. Altitude 40 feet. Population 1920, 984. The metropolis of the region and the only incorporated city in the county. Located at the head of Hammersley Inlet at the mouth of Shelton creek, with all the resources of the county to support it. Sustaining industries at present consist of lumber and shingle manufacturing, oystering, and general farming. The machine shops and railroad yards of a logging road are here. City has four churches, twelve fraternities, a four-year high school, two grade school buildings, a new library, bank, and weekly newspaper. Electric lights and municipally owned water are enjoyed. Transportation is by boat to Tacoma, and by auto stage to Olympia and Aberdeen. Freight shipments are ferried to rail connections. A county fair is held in September.

Union: A town of about 100 people, on south side of Hoods Canal, near the Skokomish river. Industries are fishing, farming and logging.

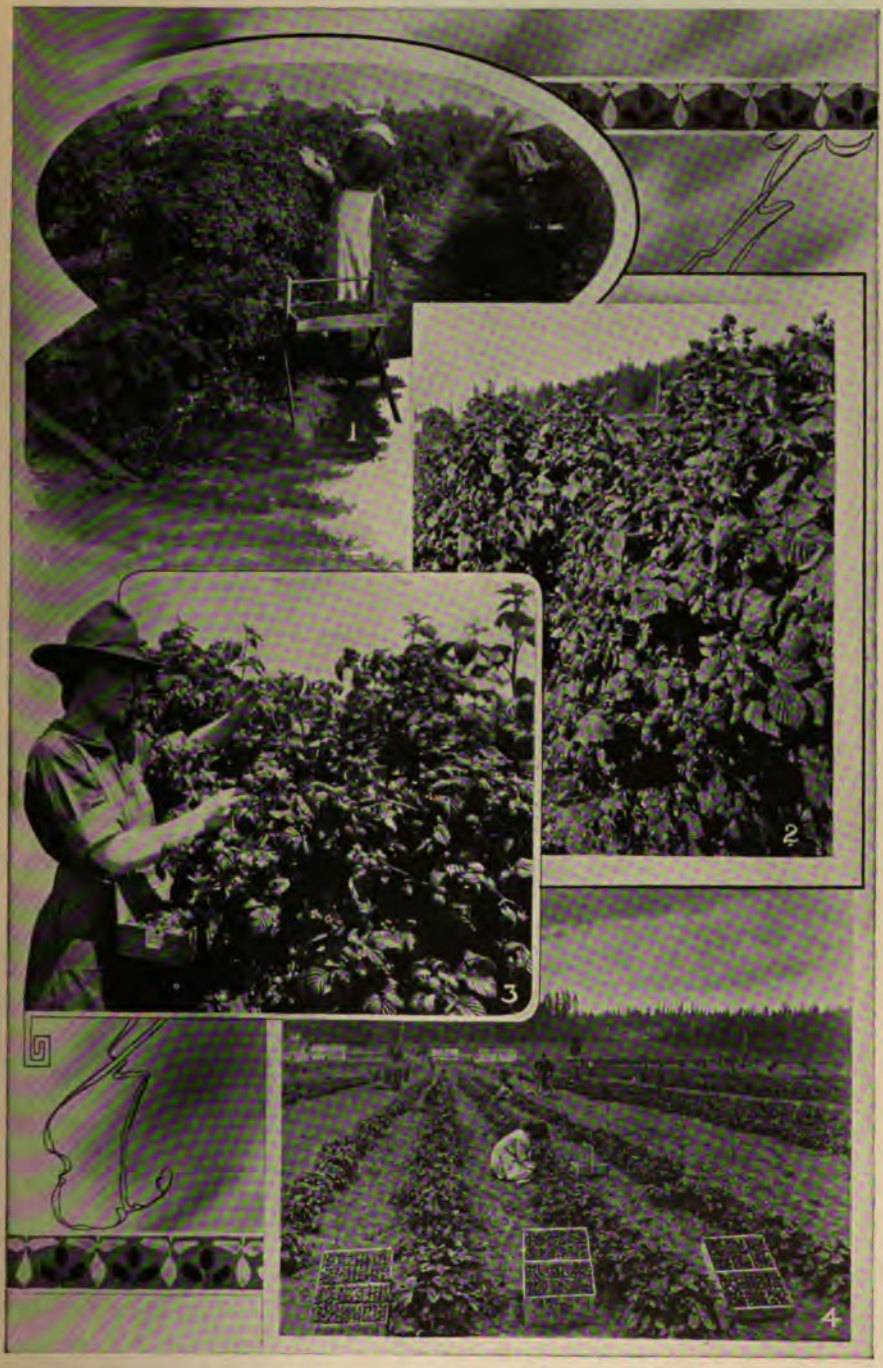
JEFFERSON COUNTY.

Jefferson county extends from the Pacific ocean to Hoods Canal, a long narrow arm of Puget Sound named after Lord Hood in 1792. Its extreme length is 88 miles and its width 23 miles.

Natural Features: It comprises the most mountainous part of the Olympic peninsula. Most of it is included in the Olympic National Forest and 600 acres, the wildest and most rugged of all, in the Mount Olympic National Monument, only a limited portion along the eastern and western shores and for a short distance up some of the valleys being inhabited and developed.

The highest elevation is reached by Mount Olympus, 8,131 feet, scaled by many a band of tourists seeking intimacy with Nature's masterpieces. Emulating this mountain in ruggedness is Mount Constance, 7,777 feet high, besides many lower peaks. The principal streams are the Elwha, flowing north into the straits; the Hoh and Queets, flowing west into the ocean; the Humptulips, emptying into Grays Harbor toward the southwest, and the Big Quilcene, Dosewallips and Duckabush, draining the eastern slopes into Hoods Canal. There are also numerous pretty mountain lakes scattered throughout the region.

Population: According to the 1920 census, the population was 6,557, or an average of 3.7 to the square mile. Most of the people live in the eastern part of the county and principally in Port Townsend and on Quimper peninsula formed by Puget Sound, Hoods Canal and Discovery Bay. The remainder are scattered



BERRY CULTURE IS RAPIDLY GROWING AND NETTING LARGE RETURNS.

(1) Picking blackberries. (2) Loganberries. (3) A beauty among the raspberries. (4) Strawberry season.

SAMPLES OF HIGHWAYS.

(1) Where mountains overshadow the way. (2) An engineering feat from the Columbia to Goldendale. (3) A serviceable thorofare.

along the shores of Hoods Canal and in the valleys formed by the Queets and Hoh rivers.

Soil: Agricultural activities are confined to the several valleys opening into the Pacific ocean, a narrow strip along Hoods Canal, and the northeast section of the county. The soils consist generally of various types of loams, with varying percentages of fine or coarse sand, gravel and clay predominating and with more or less silty material. They are generally well drained, very fertile, and adapted to general farm crops, fruit, berries, dairying and stock raising. Small fruits do wonderfully well and a specialty is being made in raising loganberries, which have been proven particularly adaptable to this section. Valuable fields of muck and peat also occur where hay, grain and celery are the most suitable crops. The more mountainous districts consist chiefly of a dark brown to red heavy loam or silty clay loam, very fertile and well drained, but with a very limited area of level topography.

Climate: The modifying influences of the salt water are very pronounced in this section of the state. In temperature variations there is a great similarity between the ocean coast and the country bordering on the Canal. At Clearwater, near the ocean, a 14-year record shows a mean minimum of 34 degrees in January and 50 degrees in July, and mean maximum of 43.4 degrees in January and 71.1 degrees in July. At Port Townsend, a 20-year record shows a mean minimum of 35 degrees in January and 50.8 degrees in July, and a mean maximum of 43.5 degrees in January and 65.2 degrees in July. In precipitation, however, the two extremes in western Washington take place, the annual for a period of 14 years at Clearwater being 127 inches, and the annual for a 16-year period at Port Townsend being only 20.68 inches. Scarcely any snow falls. Growing period at Port Townsend averages 254 days.

Lands: The total area of the county is 1,118,080 acres, of which the Olympic National Forest comprises 747,447 acres; Indian reservations contain about 3,000 acres; military reservations, 4,887 acres; and state lands, 74,630; leaving less than 300,000 acres for private occupancy. About 7,000 acres, including 2,000 acres of oyster lands, are improved and 170,000 acres are logged-off. Of the logged-off lands, about 50,000 acres are suitable for intensive farming and 60,000 acres for grazing.

Prices of Lands: Unimproved land will cost from $10 to $50, and improved from $75 to $300, according to soil, location and nature and extent of improvements.

Resources and Industries: The resources of this county have been thus far scarcely touched. They are extensive and varied. First in importance for immediate benefit are the dense forests of Douglas fir, spruce and cedar. Altogether about thirty billion board feet remain uncut, ten billion on private lands and twenty billion board feet in the national forest. The growth is remarkably heavy, as much as 50,000 feet to the acre in some sections. Numerous camps are continually busy cutting logs for immense lumber and shingle mills.

Mining has been very little worked but in many districts coal, gold, silver, copper and other minerals have been discovered. It is believed also that large oil fields exist and they are being prospected at the present time.

The waters teem with fish, which keep a number of large canneries going. Two thousand acres of oyster lands hold out splendid prospects. There is no immediate limit to the possibilities for stock raising and dairying, which are already developed to a considerable degree. The county has about 1,700 milch cows and some of the best pure-bred dairy herds in the state are on the peninsula to the south of Port Townsend. Two creameries and two cheese factories are supported at Chimacum and one cheese factory at Center. Poultry raising is increasing in importance. About 12,000 apple trees are in bearing, also about 1,000 plum and prune trees, 2,000 cherry trees and 800 pear trees.

Scarcely any water power has been developed, but the Little and Big Quilcene rivers, the Dosewallips and the Duckabush, each flowing into Hoods Canal; and the Hoh, Clearwater, Queets and Bogachiel emptying into the ocean, hold unlimited possibilities. This is also an ideal region for summer outings. The

scenic, sanitary and climatic conditions are building up health and tourist resorts on both the east and west slopes. The waters abound in trout, salmon, halibut and bass, while the woods give refuge to deer, elk, bear and cougar. Grouse, quail and ducks are plentiful.

Transportation: There are but 41 miles of railroad in the county and this is in the northeast section connecting Port Townsend with Quilcene and Port Angeles. Trains are met at Port Townsend by steamers for Seattle. Regular steamers independent of train service also give daily transportation to Seattle, Port Angeles and Victoria, B. C. The water distance to Seattle has been recently shortened by a government canal from Oak bay to Townsend bay. Good wagon roads reach all important inland centers and connect with the Olympic Highway, a state road already built nearly round the peninsula, and soon to completely encircle it. All points in the eastern end are served by daily auto stages.

Markets: Practically all farm and dairy products are consumed in the county itself, by the cities and towns, logging and fishing camps, military forts and summer resorts. Shingles are scowed across the Sound and most of the lumber is loaded onto deep sea vessels for foreign ports.

Social Conditions: In the isolated districts social development would naturally be backward. In the coast and Sound communities, however, where opportunities for social contact is offered, attention is paid to the esthetic as well as to material progress. There are 24 postoffices and 24 school districts serving as centers. High schools are located at Port Townsend, Quilcene and Chimacum. Church facilities are provided and general hospitality obtains. The resort features attract many visitors during the summer months.

CITIES AND TOWNS.

Brinnon: A community of about 300 people in the valley of the Dosewallips, close by Hoods Canal, and serving as a trading center for a number of logging camps. Several stores, a church and school are supplied.

Chimacum: A dairying center of about 200 people in the northeastern corner of county, nine miles south of Port Townsend. It has the only two creameries in the county, a four-year high school and church facilities.

Port Townsend: County seat, and commercial center for the northeastern section of the Olympic peninsula. Population 1920, 2,847. Located on Quimper peninsula in the northeastern part of county at the entrance to Puget Sound. It is also a port of entry and a U. S. immigration, quarantine and revenue cutter service station. It has a United States custom office, a Marine hospital, United States quarantine service and hydrographic service. Adjoining it on the north is Fort Worden, Puget Sound headquarters of the United States coast artillery. Fort Casey and Fort Flagler are just across the bay. The port on which the city is located is one of the best on the coast and has been an important factor in its past growth. The principal industries consist of salmon canneries, a fertilizer manufacturing plant, saw mills, and several woodworking plants, including a boat-building works. It has a four-year high school, seven churches, a public park, daily paper and two banks. Among the city improvements are municipal water works and sanitary sewers, gas and electric lights and paved streets and walks. Transportation is furnished by sound steamers and by rail to Port Angeles and Quilcene. A government canal recently built shortens the distance to Seattle.

Quilcene: A town of about 300, located at terminus of the Seattle, Port Angeles & Western railway, on the Olympic Highway and close to Hoods Canal. It is the second city of importance in the county. In the vicinity are a shingle mill and several logging camps, also good farm lands, mineral lands and oyster lands. A four-year high school, two churches, six fraternities, and a weekly paper are maintained. Manufactures amount to between $100,000 and $150,000 yearly. Taxable wealth is about $200,000.

CLALLAM COUNTY.

The Strait of Juan de Fuca laving the northern shores and the Pacific ocean bounding it on the west give this county 150 miles of shore line and a number of splendid harbors.

Topography: A strip of territory from five to twenty miles in width along the northern and western extremities, which includes a broad plateau of from one to three miles in width extending from Gettysburg, 24 miles west of Port Angeles, almost to the eastern boundary of the county, embraces most of the cultivated and developed area. All the remainder of the county is included in the Olympic National Forest Reserve, which covers also most of Jefferson and large portions of Grays Harbor and Mason counties. The interior is enveloped by rugged mountains from 3,000 to 6,000 feet in height whose foothills gradually blend with the less rolling areas to the north and west. Numerous deep canyons have been cut by short swift-flowing streams, forcing their way to deep water. The principal ones are the Dungeness, the Elwha, the Clallam and the Sol Duc.

Population: According to the United States census, 6,755 persons were living in the county in 1900. Considerable activity in railroad building, spruce production and other enterprises have brought about much growth since—the 1920 census recording 11,368, an increase of 68.3%. The majority live in Port Angeles and Sequim, the two largest cities. Of the foreign-born, Scandinavians and Germans are in the lead.

Soils: The prevailing soils of the uplands and plateaus available for agriculture belong to what is classified as the Clallam series. "They are of gray color, sometimes grading to light grayish brown, and are predominantly of fine texture, consisting mainly of fine sand, silt, and silty clay. The subsoils consist mainly of compact silty loams or silty clay loams and are generally of slightly lighter color than the surface material. More or less fine gravel and a considerable quantity of iron pellets occur in all the soils of the series." They are rich in lime content and phosphoric acid and nitrogen, and from one to ten feet deep and well drained. All are susceptible to intensive cultivation and the growing of hay, grasses, fruit, root crops and berries.

Climate: The climate is mild and equable. Precipitation varies from 116 inches at Forks to 84 inches at Tatoosh and 29.8 inches at Port Angeles, but it is only about 20 inches in the northeastern section around Sequim. The heavy rains fall during the winter months. There are no extremes of heat or cold. The mean minimum temperature at Port Angeles is 39.9 degrees and the mean maximum 53.6 degrees. Growing season is about 200 days. As a whole, the climatic conditions are so favorable that the northern shores and inland lakes have become famous as summer health resorts.

Land: Of the entire 1,104,640 acres within the limits of this county, 466,807 acres are included in the forest reserve; 24,517 acres are in three Indian reservations; 67,283 acres are state lands, and 820 acres are unreserved and unappropriated federal lands. Not more than 25,000 acres have thus far been improved, but six times that amount is suitable for agricultural development. Most of this is in the logged-off state, but considerable is included in 12 prairies located within the northeastern townships. In addition to the forest reserve, about 375,000 acres of private lands are covered with big timber.

Prices of Land: Lands are reasonable in price and may be bought in large or small tracts. Generally speaking, prices for improved lands run from $100 to $400 per acre, while unimproved areas go from $35 to $75. The highest priced lands lie near Port Angeles, Sequim and Dungeness. Grazing lands are worth from $10 to $35. Land may be made ready for dairying by burning and seeding. Opportunities for leasing for cash or on shares are frequent.

Timber: Timber is by far the most important of the immediately available resources of the county. One of the heaviest stands in the United States remains here. It is

estimated that 25,000,000 feet may still be cut from the public, state and private lands. A recent cruise shows that fifteen billion feet are left in the 380,000 acres of privately owned alone, segregated as follows:

	Feet
Douglas Fir	5,577,018,750
White Fir	472,290,500
Balsam and Lovely Fir	3,844,000
Spruce	1,857,026,250
Cedar	1,730,659,500
Hemlock	4,776,695,000
Larch	45,134,750
Maple, Pine and White Pine	1,487,500
Dead Fir, Spruce and Cedar	119,554,750

	No. of
Cords of Cedar Bolts, Alder, Cottonwood	453,006
Poles	3,804,218
Ties	8,085,293
Cedar Fence Posts	23,950
Cords Wood	2,740

Some of the largest mills in the country are engaged in cutting this up into lumber to be shipped to all parts of the world. Almost every little port includes at least one saw or shingle mill among its industries. During the war this section was one of the heaviest producers of spruce lumber in the Northwest.

Agricultural Pursuits: Agricultural industries are rapidly coming to the front as the logged-off land is made more use of and the population increases. Dairying and cattle raising have for some time been carried on in large proportions; 3,000 milch cows are kept and five creameries making about 1,000,000 pounds of butter annually are supported. There are also about 25,000 apple trees and 8,500 plum, prune, cherry and pear trees. Hay, small grain, roots, potatoes and seed are all raised at a profit.

Other Resources and Industries: Fisheries are also of vast importance, large quantities of salmon, crabs and clams being caught. A number of fish hatcheries are maintained and over two million fry are planted each year.

It is known that the county is highly mineralized. Among the minerals found are clay, coal, silica, sandstone and limestone. Precious metals are here, but have not been found in paying quantities. There are strong indications of oil and wells are being sunk at Forks in the southwestern corner and near Sequim in the northeastern section.

Water power can be developed to the extent of 100,000 horsepower or more in the Dungeness, Sol Duc, Hoko, Beaver and numerous smaller streams. Thus far about 10,000 horsepower has been developed in the Elwha river, seven miles west of Port Angeles, by the Olympic Power Company. This plant supplies power to Port Angeles, Port Townsend, Bremerton, Fort Worden, Fort Flagler and the United States navy yard at Bremerton.

Transportation and Highways: Steam railroad trackage has increased considerably within the past three years. The Seattle, Port Angeles and Western railway now has 62 miles of main track and brings the northern and eastern points in quick communication with Seattle and other Puget Sound points. The logging road used by the government for spruce hauling penetrates much of the interior toward the coast and will in time be a link in a road extending all around the peninsula. The Olympic Highway, a state road, designed to circle the peninsula and already connecting with Olympia and the Grays Harbor country at the southern extremities, has been extended to Forks, near the southwest corner of this county. This is used now by stages which operate between the principal centers and interior points.

Social Conditions: The rural districts as well as the main centers are provided with good school facilities and practically all religious denominations are represented. There are 41 school districts, in five of which high school pupils are enrolled. Of postoffices, 20 are maintained with three rural routes. Among the annual features are the county fair held at Port Angeles and the harvest home festival at Sequim, the irrigation center. Many tourists frequent this county in summer, attracted by the big trees, the scenic highways and various mountain and lake resorts.

CITIES, TOWNS AND VILLAGES.

Dungeness: A village of about 200, located on a low peninsula formed by Dungeness river, five miles north of Sequim and 16 miles east of Port Angeles. It is supported by a rich dairy country and crab fisheries. Several companies are engaged in catching and canning the famous Dungeness crabs. A large creamery is supported and sev-

eral trading companies operate. Daily steamers run to all strait points, Port Townsend and Seattle.

Forks: A town of about 200 people, located on Forks prairie and the Olympic Highway, in the western part of county, where several rich valleys converge. Dairying and lumbering are the sustaining industries. A creamery makes about a ton of butter each week. Town has high school, church and fraternal organization. Stages run to Port Angeles and Clallam bay.

Neah Bay: An old Indian village in the northwest corner of the county within the Makah Indian reservation. Many fishermen are here in the summer time. A fish cannery, a Presbyterian mission and the Indian agency are located here.

Port Angeles: County seat. Population 1910, 2,286; 1920 census, 5,351. This is the leading city in Clallam county. Its fortunate location on a splendid harbor, close to unlimited resources of timber, fish, mineral and agricultural wealth, and at the gateway to the scenic attractions of the Olympic mountains has given it a rapid growth. Among the most important industries operating at present are several large modern saw and shingle mills, one of which is claimed to be the largest in the world, a cooperative salmon cannery, a sash and door factory, and cooperative creamery. New industries include a boxboard factory and a pulp and paper plant. The city has three banks, with deposits of about $2,000,000, a modern courthouse, a new B. P. O. E. building, a four-year high school with 200 pupils enrolled, nine churches, a Carnegie library of 2,500 volumes, two public parks, one of which is a free camping ground; two daily and one weekly newspaper, paved business streets, splendid water supply, modern sewerage system, electric lights and paid fire department. Transportation is by the Chicago, Milwaukee & St. Paul trains, daily steamers, stages and trucks. The Olympic Highway, one of the most scenic state highways, brings tourist and pleasure seekers from the Sound cities and all parts of the continent.

Sequim: Altitude 205 feet. Population, 1920 census, 402. Located on the Chicago, Milwaukee & St. Paul railway, three miles from salt water, in the northeastern section of county. It is the center of a large irrigated farming tract known as Sequim prairie, comprising about 2,500 acres of irrigated land and is the principal town and trading point for an irrigation district of over 20,000 acres and for additional territory comprising 10,000 acres of nonirrigable farming land. All country north and west is level for several miles, suitable for small fruits, vegetables and seed growing, general farming and dairying. A large creamery, cannery, saw and shingle mills, three churches, a four-year high school, and a weekly newspaper are maintained. City also has seven fraternal organizations, a public park, a city library, piped water, and volunteer fire department. Steamboat and auto transportation are provided.

GRAYS HARBOR COUNTY.

This county, named after Captain Gray, who discovered the great bay of that name in 1792, lies central within the tier of counties facing on the Pacific ocean.

Natural Features: The principal physiological features consist of Grays Harbor, a beautiful inland sea navigable to vessels of 20 feet draught; the Chehalis river valley with an average width of about two miles, extending east and west to Grays Harbor; the rolling to hilly uplands bordering this valley on both sides and merging with the Olympic mountains in the north; and the extensive table lands lying between the Humptulips river and the ocean.

The Satsop, Wynoochee and Wishkah rivers, flowing into the Chehalis river from the north, the North river draining some of the southwest townships into Willapa bay, the Humptulips and Hoquiam rivers flowing into Grays Harbor, and the Copalis and Moclips rivers flowing into the ocean, are the principal streams of the region. The deep water frontage is about 60 miles on the ocean and an equal distance on Grays Harbor. The whole county was once densely timbered, the uplands with fir, spruce, cedar an

hemlock and the river banks with larch, cottonwood, maple and other soft varieties.

Population: The 1910 census gave the county 35,590, which represents an increase of 137 per cent over the previous census figures. The 1920 census reported 44,572, an increase of about 25 per cent in ten years. A comparatively rapid growth is continuing. The school population for 1919 was 11,468. Most of the people live in the Harbor cities and the smaller towns of the Chehalis valley. The foreign population is well mixed with Swedes, Norwegians and Germans.

Soil: The prevailing soil is a heavy clay loam, rich in phosphoric acid and nitrogen and possessing a normal quantity of lime and a liberal supply of potash. In the valleys a deep silty loam is prominent, more fertile even than the uplands. It is ideal for soft grains, fruits, berries, vegetables and dairy forage. Near tide water considerable rich cranberry marsh is found, much of which is already in bearing. Upon the stump lands of the more hilly regions sheep and goats could be turned loose with advantage both to the animals and land.

Climate: All the climatic advantages of proximity to a great ocean with its mysterious moderating influences are enjoyed in most parts of this county. The summers are always cool and comfortable while the winters are visited by comparatively light frosts. The growing period averages 186 days. The annual mean temperature is about 50 degrees. The precipitation in the Chehalis valley varies from 60 inches near the eastern extremity to 86 inches at Aberdeen. Nearly 60 per cent of this falls between November 1 and March 1, while July and August average about an inch each.

Lands: The total land area is approximately 1,233,280 acres, of which 47,665 acres are state lands, 158,357 acres are in forest reserves and 200,000 acres are unallotted lands in the Quiniault Indian reservation. This leaves a total area in private ownership of about 823,000 acres, half of which is still in timber. Although the timber has been removed from about 400,000 acres, less than 25,000 acres have been improved, leaving a vast acreage of logged-off lands well suited to dairying and stock raising and much of it suitable for all lines of western Washington farming when thoroughly cleared. The bulk of the level lands and most of that which is cleared lies in the Chehalis valley and along some of the smaller streams and on the plateau stretching from the Humptulips river to the ocean. Immediately adjacent to the Harbor and the southern stretch of ocean beach is considerable tide land and other rich bottom land, very fertile for truck farming when properly drained.

Prices of Land: Desirable unimproved agricultural land in the logged-off state ranges around $50 to $75 per acre, but there is considerable bench land further away from the centers which can be had for as low as $10 to $25. On the other hand, certain select areas will go to $100 an acre. Improved lands in hay or devoted to general farming range from $120 to $300 per acre. Unimproved cranberry lands sell for about $125 per acre.

Timber: Timber and forest products have thus far yielded the bulk of the wealth of this county and will probably continue to do so for years to come, especially if reforestation is resorted to, for this is one of the most densely timbered regions in the state. A cruise taken about 10 years ago shows about 22 billion board feet of standing timber on private lands and about 14 billion feet in the national forest and Indian reservations. For the past several years the output of the mills has been about 800 million feet of lumber and close to half a billion shingles. Even with such a drain on this resource, there would still remain at least 30 billion feet in the county and a larger additional quantity outside the county but tributary to the markets of this region.

Manufacturing and Water Power: Much undeveloped water power exists in the various mountain streams originating in the Olympic mountains. In the Quiniault and Wynooche rivers alone it is estimated that 50,000 horsepower could be developed.

Manufactures, including principally lumber and shingles, ships, wooden ware and preserved foods, amounts to about $23,000,000 yearly. At Aberdeen the first wooden ship

for the Emergency Fleet Corporation was launched, and the world record for speed in ship construction was broken by the launching of the "Aberdeen."

Fisheries: The fisheries are very important, yielding close to a million dollars annually in packed fish. The salmon fisheries rank first, with clams, mussels, crabs and miscellaneous fish following. In addition a large whaling station is located at Bay City where about 100 whales are received and preserved yearly.

Agricultural Pursuits: Agriculture is gradually increasing as the timber is removed, but its possibilities are far from being realized at present. The small acreage already devoted to agriculture shows that all field and garden crops will flourish. Dairying and livestock pursuits lead and are destined to a splendid future; for this industry the logged-off lands afford splendid opportunity. Alfalfa has been found suitable for this section and its future growth will increase the importance of all livestock industries. There are two creameries, one condensery, three cheese factories and over 4,000 cows in the county with a fair representation of hogs, stock cattle, horses and sheep.

Horticulture has attained a fair start. There are now over 24,000 trees, including 16,000 apple trees, 2,000 pear trees, 3,500 plum and prune trees, 1,500 cherries and a few peaches, quinces and walnuts. About 150 acres of cranberries and 100 acres of other berries have been planted.

Minerals: The mineral possibilities are very bright. Large beds of brick-clay are found in many parts of the county. Coal and iron deposits have been located in the Chehalis river valley, and elsewhere. Gold, silver, iron, lead and copper exist in the Olympic range, but need transportation improvements for their development. Principal interest centers in the efforts to locate oil, which shows every indication of existing in large quantities. Several wells are being sunk, including one by the Standard Oil Company at Moclips.

Transportation and Highways: All modes of transportation are utilized. There are 213 miles of steam railroad trackage in the county. The Northern Pacific railway operates along the right bank of the Chehalis river and northward along the ocean beach to Moclips, with a branch northeast from Elma and another from Aberdeen to Bay City on the south side of the Harbor. The Oregon-Washington Railroad and Navigation Company and the Chicago, Milwaukee & St. Paul railway serve the country on the left bank of the river as far as Hoquiam and an electric line connects the cities of Hoquiam, Aberdeen and Cosmopolis. The Chehalis river is navigable as far as Montesano and ocean steamers leave Grays Harbor for all parts of the world.

The highways are generally paved or well graveled. They already connect up the principal points with the Olympic Highway, which at present serves the Chehalis river valley and extends north to Lake Quiniault.

Markets: Its own large cities afford ready markets for nearly all the farm products. Most of the lumber and shingles are marketed in foreign countries and eastern states. Surplus fish, crabs, clams, fruit and vegetables preserved by its canneries are marketed through the large centers of the Harbor and Sound sections.

Social Conditions: The pioneer work has been accomplished and the county has reached that stage when the higher social development can be encouraged. Modern schools, churches, libraries, theaters, club buildings, hospitals, parks, and other institutions contributing to social welfare are generously provided, and the county is divided into 50 school districts and seven high school districts. There are 33 postoffices and five rural routes. Over 6,224 miles of telephone wire are in use.

CITIES AND TOWNS.

Aberdeen: Population 1910, 13,660; 1920, 15,337. Area in corporate limits 10½ square miles. Assessed valuation $6,213,413. Located on Grays Harbor, in the center of one of the richest timber sections of the state. The lumber industry soon made this city the metropolis of the county and its future advancement is assured from a future development of this and related industries. The development of the tributary farming region will also contribute to a stable and permanently prosperous condition. At

Southwest Washington

LEWIS COUNTY.

This important county dates back to 1845 and was the first to be organized in the state. It occupies the central part of southwestern Washington, extending 95 miles east and west and 26 miles north and south. Its total area is 2,369 square miles.

Topography: The extreme east is occupied by the foothills and western slopes of the Cascade mountains, and is included in the Rainier National Forest Reserve. The western extremity is occupied by the low coast range, which reaches its highest altitude in this county in the southwest corner. Between these two extremes are broad river valleys and rolling table lands composing about 70 per cent of the county. The Chehalis river, with its south and west forks and its tributaries, the Newaukum and Skookumchuck, drains most of the western townships into Grays Harbor. The Cowlitz, rising in the Cascades and flowing almost the entire length of the county, drains the extreme east and the southern half into the Columbia. A few townships in the north central are drained northward into Puget Sound through tributaries of the Nisqually. The level valley lands bordering the principal rivers have an average width of from one to four miles. The territory on either side of these valleys consists of level to gently rolling and hilly uplands. All was originally covered with dense forests.

Population: In 1910 the county had a population of 32,127, representing an increase in 10 years of 112 per cent. A steady growth has continued and will for years to come as the rich resources are developed and the lands are settled up. The 1920 census recorded 36,740, an increase of 14.3%, the majority of whom live in the Chehalis valley, where the largest cities, Centralia and Chehalis, are located.

Soil: The valleys consist generally of clay loams, silty clay loams, and fine sandy loams of various types and textures, well provided with rich vegetable matter and satisfactory subsoils. Some is what is commonly called "alder bottom" and in a few places muck and peat and beaver-dam occur. Hay yields from 2½ to 3½ tons per acre, oats from 60 to 125 bushels, and potatoes from 200 to 400 bushels. The principal upland soil is silty clay and contains 59 per cent of silt and 31 per cent of clay, well suited to all crops grown in this section, especially grains and grasses. The average oat yield is over 60 bushels per acre and the average wheat yield about 35 bushels per acre.

Climate: The climate is generally very moderate the year round, and ideal for plant growth common to the temperate zone. The mean annual maximum at Centralia, an elevation of 212 feet, is 61.3 degrees; the mean annual minimum, 40.3 degrees. The winter season is comparatively warm with little or no snow. No zero weather has ever occurred, so far as the records show. The rains come gently and grass is green the year round. Annual precipitation is 45.94 inches. Growing season is 159 days. In the mountainous regions a greater precipitation naturally takes place. Prevailing winds are from the south.

Lands: The total area of the county is 1,516,160 acres, of which 441,796 acres are included in the forest reserves, 75,762 are in the title of the state, and 67,994 acres are still unappropriated and unreserved, described as "rough timber and grazing." About 65,000 acres have been improved, 412,000 acres are privately owned timber lands, and about 500,000 acres are private lands from which the timber has been removed. This last is what is known as logged-off or cut-over land with occasional pieces that have been burnt over; much of it is excellent for farming purposes and all well suited for grazing and stock raising.

Prices of Land: Valley lands, unimproved, are worth from $25 to $100 an acre; improved, they will

fetch from $75 to $250. Bench lands, unimproved, are worth from $20 to $125. More of the unimproved land is purchasable than of the improved. Leases can often be obtained on improved or partially improved farms.

Resources and Industries: Timber, agricultural lands and mines are the most important resources of the county. Over 400,000 acres of privately owned timber lands remain and an equal quantity and more have already given way to an army of woodsmen and lumber and shingle manufacturers who cut in the neighborhood of 300,000,000 feet annually. Between 15 and 20 billion feet remain on these lands and a corresponding stumpage on the forest reserves. This will in time be supplemented with the reforestation area.

The county is known to be underlaid with lignite coal and 11 mines are in operation with an annual yield of between 150,000 and 200,000 tons. There is also much clay; and some copper, lead, quicksilver and arsenic are known to exist. The presence of petroleum is apparent from seepages.

Among the agricultural enterprises, dairying and stock raising takes the lead, encouraged by the large condensery at Chehalis and the creameries at Centralia and Winlock. There are about 12,000 milch cows and 5,000 hogs, besides many horses, stock cattle, and sheep in the county. Hay and oats are the principal crops, but wheat, hops and berries grow exceptionally well. About 35,000 apple trees, 11,200 pear trees, 11,000 plum and prune trees and 8,000 cherry trees are other sources of income.

Manufacturing is carried on in the largest cities and bids fair to increase as the water power of the hills is developed and the many advantages of the region become better known.

Transportation and Highways: The county is traversed north and south by the main lines of the Northern Pacific, Great Northern, and Oregon-Washington railways, all running over the same tracks. Branch lines extend to Willapa Harbor and Grays Harbor and north to Olympia. Several logging and coal roads penetrate the forests and mining regions and supply tonnage for long hauls. Total steam railroad trackage is 236 miles. Centralia and Chehalis, four miles apart, are connected by an interurban.

Supplementing the railroads, excellent highways, including the Pacific, running north and south, the National Park leading to Mount Rainier, and the Ocean Beach to Willapa Harbor, connect with a network of county roads serving the most remote farming districts. These conditions facilitate the quick transportation of all surplus commodities to the local cities, Puget Sound, Grays Harbor and Portland.

Educational and Social: Evidences of prosperity are very marked. The cities exhibit expensive public buildings and business blocks, homes of ornate architecture, and well-kept parks, with paved streets, cement walks and all the needed public utilities. Libraries, churches, fraternal organizations, granges and school centers are well distributed. A new state normal school has just been established at Centralia. This, with 78 school districts, 15 high school districts, and three private schools places educational advantages within the reach of all. Six newspapers are published, mail service is rendered by 50 postoffices and six rural routes and telegraph communication is assured by 2,885 miles of wire.

CITIES AND TOWNS.

Centralia: Altitude 184 feet. Population 1910, 7,311; 1920, 7,549. Located at the junction of the Chehalis and Skookumchuck rivers, 50 miles south of Tacoma and 94 miles north of Portland. Its rapid growth in 20 years from a town of 1,600 population was due to the heavy stand of tributary timber, the proximity of productive coal mines, the fertility of its cleared lands, and its desirable location for a railroad center. Through this city the output of the Tono and Mendota mines and of several smaller ones closer in are marketed. The dense fir and cedar timber is being manufactured into lumber and shingles by several large sawmills with daily capacity of about 350,000 feet, and four shingle mills. Other manufacturing enterprises include two crossarm factories, a fir door factory, a furniture factory, two creameries, a cold storage plant, two foundry and

machine shops, a brick and tile plant, a glove factory and numerous other smaller industries. As a railroad center it is the division point of the Northern Pacific, Oregon-Washington, and Great Northern railways, at their junction with the Willapa Harbor and Grays Harbor branches. Nearly a million dollars have been spent on railway improvements, including a modern union depot. The city has three banks, a $125,000 high school, six grade schools, a Carnegie library, two daily papers, churches of all denominations, electric lights, gas, paved streets, 14 miles of sewers, 60 miles of cement walks, city water and a paid fire department.

Chehalis: County seat. Altitude 188 feet. Population 1910, 4,507; 1920, 4,558. Located at the junction of the Chehalis and Newaukum rivers and the crossing of the Pacific, National Park and Ocean Beach highways, midway between Portland and Seattle. It is served by the Northern Pacific, Great Northern, and Oregon-Washington main lines and by the Willapa Harbor branches of the Chicago, Milwaukee & St. Paul and Northern Pacific railways. It is linked by trolley with Centralia four miles north and together they are called "Twin Cities." Coal mining, lumbering and farming are important sustaining industries. Two coal mines are located within the city limits and others are operated not far away. Other important industries include two large sawmills, a furniture factory, a toy factory, milk condensery, a fruit and vegetable cannery, creamery, ice plant, brick and tile plant, a cigar factory, bottling works, and marble works. It is also the home of the State Training School. It is a city of pretty homes and well provided with public utilities. Much activity is taking place and additional is assured for the following years. It now has three banks, with deposits of nearly four million dollars, two newspapers, a four-year high school, two grade schools, eight churches, a public library, municipal waterworks, two public parks, paved streets, and cement walks.

Doty: Elevation 322 feet. A lumber and shingle manufacturing town on the N. P. and C., M. & St. P. branch lines, eight miles west of Chehalis. It has a four-year high school, church and Y. M. C. A. Entire lumber output amounts to about $800,000 annually.

Dryad: Elevation 304 feet. A sawmill town on the N. P. and C., M. & St. P. branch lines, 17 miles west of Chehalis. It has a sawmill with monthly payroll of $12,000, a four-year high school and a Baptist church.

Littel: Elevation 190 feet. A town of about 300 people, located on the South Bend branch of the Northern Pacific railway, five miles west of Chehalis. Saw and shingle mills are in operation. A church and good school facilities are maintained.

Mendota: Altitude 313 feet. A company coal mining town of about 300 people, located at the terminus of the Centralia Eastern railroad, 12 miles east of Centralia. About 60,000 tons of coal are produced annually.

Mineral: Elevation 1,439 feet. Located on the Tacoma Eastern railway and the National Park Highway, 50 miles northeast of Chehalis. A large body of timber land surrounds it. Lumber, shingle and coal are the chief products, but grazing will be ultimately profitable on the rough lands. Church and school facilities are ample.

Morton: Altitude 945 feet. Population 1920 census, 522. Located on the Tacoma Eastern branch of the Chicago, Milwaukee & St. Paul railway and often called the gateway to eastern Lewis county. Lumber, agricultural and coal lands, and water power sites are near. Principal industry is lumbering, which is represented by four different concerns with a monthly payroll of about $15,000. The town has a bank, weekly newspaper, four-year high school, church, gravity water system, electric lights and city park.

Napavine: Altitude 441 feet. Population 1920, 340. Located on the Northern Pacific main line, seven miles south of Chehalis. The principal industries are lumbering and farming. It has two sawmills, a high school, four churches and electric lights.

Onalaska: A town of about 750 people, 16 miles southeast of Chehalis, in the Newaukum valley. About $75,000 worth of lumber is cut annually. Town has a church.

good school, and a park. The Newaukum valley railroad operates from Napavine.

Pe Ell: Elevation 412 feet. Population 1910, 838. Census of 1920, 861. Principal town on the Willapa Harbor branch of the Northern Pacific railway, 23 miles southwest of Chehalis. It has a sawmill supplied with logs by a number of camps in the vicinity. Much good farming and grazing land is adjacent and dairying has splendid possibilities. Water power is available in the Cowlitz river and will sometime influence manufacturing. Four churches, a four-year high school, a newspaper and a bank are supported.

Toledo: Population 1910, 375. Census of 1920, 324. Located on the Cowlitz river and the Pacific Highway, eight miles southeast of Winlock. A $180,000 bridge spans the river right in town. Innumerable tracts of timber, undeveloped water power and coal lands, and stretches of fertile logged-off and prairie lands are adjacent. A cheese factory and incubator plant are in operation. A newspaper, bank, four-year high school, two churches and six fraternal organizations are supported. Stages run to Winlock and Chehalis.

Vader: Elevation 139 feet. Population 1920, 500. Located on the main line of the three principal railways, and close to southern boundary of county. It is the center of a large farming region of the Cowlitz valley and has a sawmill, bank, a three-year high school and three churches. Considerable clay of superior quality is in vicinity.

Winlock: Elevation 308 feet. Population 1910, 1,140. Census of 1920, 832. Located in southwestern part of county on the line of the three trunk railways in the rich Olequa valley. Main industries include a lumber mill, brick and tile factory and a creamery. City has a bank, weekly paper, a four-year high school, five churches, electric lights, cement walks, and volunteer fire department.

PACIFIC COUNTY.

Pacific county, situated in the extreme southwestern part of the state, overlooks the Pacific ocean on the west and has the Columbia river for part of its southern boundary.

Natural Features: A great inland sea known as Willapa Bay cuts deeply into the county and extends almost the entire distance north and south, permitting splendid harbor facilities for deep sea vessels, with the estuaries of the rivers creating much rich tide and swamp lands extending some distance back from the shore line. To the east and north of this great bay the elevation gradually rises to the level of the rolling uplands, which extending eastward finally converges with the foothills of the low Coast Range, whose highest elevation of 1,000 feet is reached along the eastern boundary line. A number of important streams rise in these mountains and find their way into Willapa Bay, creating considerable rich bottom lands which extends for some distance back from their mouths.

Population: This county has increased nearly 20 per cent in population since the 1910 census, which credited it with 12,532 people, or 109.5 per cent more than ten years before. The 1920 census credits it with 14,891, living principally in the harbor cities and on the narrow peninsula which bounds the harbor on the west. Its school population May 1, 1919, was 4,149. There is a large sprinkling of Scandinavians, Germans, Finns and Greeks.

Lands: Of the 572,800 acres constituting the entire land area of the county, all but about 51,560 acres remaining in the State's right and 335 acres in the Shoalwater Indian reservation have passed into private ownership. Of the privately owned lands, about 300,000 acres are covered with virgin timber, 8,500 acres are improved and the remainder is logged or burnt off. In addition there are about 25,000 acres of rich tide land, suitable for agriculture when drained and diked, and 15,000 acres of oyster ground. A much larger area now suitable for dairying will respond to intensive cultivation when cleared of stumps. The low flat peninsula forming the western boundary to Willapa Bay contains be-

tween 4,000 and 5,000 acres of bog well suited to the growing of cranberries, an industry gradually increasing in importance.

Prices of Land: Unimproved agricultural lands somewhat remote may be purchased for as low as $10 per acre. Close to the cities such lands will go to $100 or more per acre. Improved hay lands or general farming land runs from $75 to $200 per acre. Cranberries in bearing will go as high as $1,500. There is also much gravelly land which may be had for $5 per acre. Opportunities exist to lease for one-third the crop or on a cash rental basis.

Soil and Climate: The three principal soils suitable for agriculture are the Melbourn silty clay loam, a medium brown to dark-brown silty clay soil, comprising a large part of the uplands; the Nazel silty clay, a dark-colored loamy silty clay with depth of 16 to 24 inches, comprising the second bottom; and the Chehalis silty clay, a grayish-brown sticky silty loam usually known as tide flat and occurring along the estuaries and low tidewater streams. Much vegetable decay occurs in these soils and all yield well under proper conditions. The tide flats are unexcelled in fertility. The others are well suited to hay, oats, kale, potatoes, and various root crops. Dairying and stock raising are profitable. The rainfall is rather heavy in this section of the state, but the temperature is mild the year round, 51.1 being recorded as the mean annual for South Bend. The growing season is 191 days.

Resources and Industries: The resources of the county are wrapped up in its heavy timber, the unbridled water power, its oyster and salmon fisheries, and in the fertile dairy and truck garden lands. The standing timber probably amounts to 15 billion feet. There are over 3,000 stock cattle, about 2,600 milch cows and 7,000 fruit trees in the county, and about 800 acres of cranberry lands are in bearing. About 75,000 bushels of potatoes and considerable hay and oats are raised. The peninsula region near Ilwaco attained a national reputation for supplying immense quantities of spagnum moss to take the place of absorbent cotton for Red Cross purposes. Bank deposits are about $3,000,000. Actual value of all taxable property is about $35,000,000.

Water Power: The principal streams with estimated water power include the Nasel, with 5,000 h. p.; the North, with 2,000 h. p.; the Smith, 1,000 h. p.; south fork of the Willapa, 500 h. p.; the Palix, 700 h. p.; and the Willapa, 500 h. p.

Transportation and Highways: About 100 miles of steam railroad are provided. A Chicago, Milwaukee & St. Paul branch runs from Chehalis to Raymond, a Northern Pacific branch operates from Centralia to Raymond and South Bend, and a branch of the Oregon-Washington Railroad and Navigation Company serves the peninsula from Megler to Nahcotta, connecting with Astoria steamers at the former and with South Bend steamers at the latter. Daily steamers carry passengers and mail to all the smaller bay landings, and ocean-going vessels load lumber in South Bend and Raymond for California and foreign ports. Interior points are reached by county roads which connect with the Ocean Beach Highway leading to Chehalis and Centralia. Stages supplement the train service.

Social Conditions: Churches of various denominations have been established wherever needed and public libraries and newspapers are maintained in the larger centers. There are 21 school districts, 12 high schools, and 26 postoffices. Telegraph and telephone service is provided with 1,456 miles of wire. The famous North Beach line of summer resorts extending 28 miles along the ocean beach, attracts thousands of people every season to enjoy the pleasures attendant upon ocean bathing, boating, fishing and clam digging.

CITIES AND TOWNS.

Bay Center: A fishing town located on Willapa bay about ten miles west of South Bend. Crab fishing, clam digging, oystering, fruit raising, dairying, cattle raising, and boat building are important.

Chinook: A fishing, agricultural and dairying town of about 250 people, seven miles east of Ilwaco, connected by boat with Astoria and by Oregon-Washington trains with the peninsula. It has a newspaper, two churches, park, and high school.

Ilwaco: Altitude, sea level. Population, 1920 census, 787. Located on Bakers bay at mouth of Columbia river. Summer resorts and cranberry and dairy lands contribute heavily to its support. Oregon-Washington trains run daily and many steamers reach the town from Portland and Astoria. The principal industries, in addition to summer resorts, are fishing, oystering, logging, farming, stock raising, fish canning and fruit raising. During war the gathering of spagnum moss was important. City has a bank, sawmill, two machine shops, three churches, a $27,000 high school and a weekly paper.

Lebam: A logging and farming center of several hundred people, on the Northern Pacific railway, 19 miles southeast of South Bend. A four-year high school, Baptist and Methodist churches, and five fraternities are provided.

Long Beach, Breakers, Ocean Park and Sea View: Ocean summer resorts on the west side of the peninsula. Thousands of people from Columbia river and Puget Sound cities spend their vacations and week-ends here. In addition to the beach attractions, gardening and fishing are important in the vicinity. All necessary community businesses are carried on and educational, religious and social opportunities are provided. The hotels are attractive and modern. Oregon-Washington trains and stages supply transportation facilities.

Nahcotta: An oyster village on the east side of the peninsula and a transfer point for Oregon-Washington trains and South Bend steamers. Cranberry lands with large possibilities are adjacent.

Nasel: A small village, 12 miles above the mouth of the Nasel river, where the south fork joins it. Timber, logged-off lands, and dairying possibilities promise much future growth. Cascara bark, blackberries, dairy products, garden truck and salmon yield a fair income at present. Two churches and a high school are provided. Lands can be had for $5 and up per acre. Stages run to Knapton on the Columbia river.

Oysterville: A fishing town located on the peninsula, 3½ miles north of the Oregon-Washington railroad terminus. Fish, clams, and oysters are canned.

Raymond: Population 1910, 2,450; 1920 census, 4,260, an increase of about 74.4 per cent. Predominating nationalities are American, Polish, Lithuanians, Finnish, Greeks, and Italians. Located on Willapa river, navigable for ocean and coastwise-going vessels, about 16 miles from Willapa Harbor bar. This stream almost surrounds the business section and provides 13 miles of available waterfront. The city has been built up chiefly by the lumber business but during the war shipbuilding became important. Fishing, dairying and berry culture are gradually growing in importance. Splendid opportunities are offered now for the location of any industry using timber or wood in any form for raw material. Among the plants now operating are a number of lumber and shingle mills, two veneer plants, two box factories, a shipyard which built a number of cargo vessels during the war, a foundry, machine shop and boiler works. Capital invested in plants and sites amounts to about $6,000,000. Much public improvement work is going on, including the dredging of the river channel, filling in tide lands, building a concrete highway, various paving projects and the construction of several large modern business blocks. City is provided with a public market, a bank having a million dollars in deposits, weekly paper, a four-year high school building, five grade schools, seven churches, a Y. M. C. A., fire department, and public library. Streets are paved or planked and electric car line connects with South Bend, two miles west. Both Northern Pacific and Chicago, Milwaukee & St. Paul trains reach it from Chehalis.

South Bend: County seat. Population 1910, 3,023. This city occupies the level land along Willapa river, 14 miles from the harbor bar, but part of the residence section is on the adjacent hills. The sustaining industries are lumber and shingle manufacturing, dairying and fishing. There are now several saw and shingle mills, a boat-building plant, fish canneries, an iron and steel works, sash and door factory, ice plant, box factory and a number of other community enterprises. Two banks, two weekly newspapers, eight churches, a four-year high school, two grade schools, and a public library are supported. The leading thoroughfares are paved and th

walks concrete. An electric railway connects with Raymond, and harbor steamers ply between this city and the various smaller places located on the bay. Ocean commerce should increase, for the bar at the mouth of Willapa Harbor is 28 feet deep at low tide. Steamship service is now maintained to San Francisco, the Hawaiian Islands, Hong Kong and other foreign ports. Principal transportation facilities are provided by Northern Pacific trains and auto stages.

Tokeland: An oyster and crab fishing village and summer resort on Toke point, near entrance to harbor. It is reached by daily steamers from South Bend.

WAHKIAKUM COUNTY.

This, the smallest mainland county in the state, fronts on the Columbia river not far from its mouth. The river is from one to seven miles wide along this portion of its course and encircles a number of low-lying islands, the largest of which are included in this county, thus giving it a total shore line of approximately 60 miles.

Topography: Most of the surface consists of rolling to hilly uplands, increasing in elevation till they merge with the low Coast range in the northeast. The southeast is a high, gently rolling to rolling plateau cut by a number of V-shaped valleys. Near the eastern border this plateau breaks away toward the Columbia river in a precipitous bluff of basalt. Toward the north it increases in roughness and elevation till it merges with the mountains. Along the course of the principal streams are narrow alluvial bottoms which generally widen out near their mouths and form extensive areas of tide flats. The islands are composed principally of tide lands. Much of the county is still well timbered, but most of the remainder is in the logged-off state.

Population: The 1910 census credited the county with a population of 3,285, or 12 persons to the square mile. The increase has been comparatively small during the past ten years, the 1920 census recording a total of 3,372, or 12.6 persons to the square mile. Most of them inhabit the towns and settlements near the mouths of the streams emptying into the Columbia river. The fishing industry has attracted many Finlanders and Scandinavians.

Soil and Climate: The principal upland soil is known as the Melbourn silty clay loam, a medium brown to dark brown soil with an average depth of 16 inches, underlain with a silty clay loam or clay loam to a depth of three feet or more. Oats and hay are splendid crops for this soil. Orchards also do well. The lower levels comprise rich silty soils containing much decayed organic material and are very productive of hay and forage crop. Some beaver dam is also found. Rainfall is comparatively heavy, probably from 50 to 60 inches yearly. There is little snow or frost and very few windy days. Summer temperature seldom exceeds 80 degrees.

Lands: Total land area is 170,880 acres, which includes 23,724 acres of state lands, about 2,000 acres reserved for military use, and only 318 acres of unreserved and unappropriated government lands. Of the privately owned lands about 50,000 acres, principally the two northeast townships, are timbered; about 6,000 acres have been put under the plow and the remainder consists of logged-off uplands or brush-covered tide flats. There are altogether about 8,000 acres of tide lands lying along the waterfront and on the river islands now being reclaimed by dikes, also some beaver-dam land in the valleys. The logged-off area is ideal for dairying and stock raising.

Prices of Land: The prices asked per acre for unimproved bottom land range from $5 to $100, but lands suitable only for grazing run as low as $10. The best grazing land is worth $50 an acre. Improved lands run in the neighborhood of $200 an acre.

Resources and Industries: Lying between Pacific and Cowlitz counties and similarly situated, Wahkiakum resembles these in resources and industries. Ranking in order of importance are lumbering, fishing,

FROM WILDERNESS TO PROSPEROUS FARM.

VEGETABLES YIELD FROM TWENTY TO FIFTY TONS PER ACRE.

(1) Mangles. (2) Cabbages. (3) Celery. (4) Carrots.

dairying and general farming. The logging camps and saw and shingle mills give employment to several hundred men and these enterprises will be sustained for years to come, for 2½ billion feet of the choicest timber in the country still remain uncut. The Columbia river salmon fisheries keep five canneries at work during the fishing season. This is preeminently a dairy county. Although the third smallest county in the state, it possesses about 2,500 milch cows, many of which are registered stock and belong to purebred herds. Two creameries are supported at Grays river and one at Skamokawa. About $200,000 worth of butter is manufactured yearly. There is also much water power to be developed, as the county is threaded with innumerable rivers and creeks, many of torrential force capable of generating considerable horsepower.

Transportation: This county at present is dependent on water transportation, but it is soon to have a road to connect with the Pacific Highway in Cowlitz county, and a right-of-way for a railroad along the river has been purchased. Several river boats stop at all the landings on their way to Portland or Astoria and pick up both passengers and freight; but many people cross the river and connect with trains running between Portland and Astoria.

Social and Education: The county has 11 postoffices and is divided into 21 school districts. The only high school at present is at Cathlamet, the county seat. Newspapers are issued at Cathlamet and Skamokawa. A county development association, a cow testing association and other organizations are active agencies for the building up of this section of the state.

CITIES AND TOWNS.

Cathlamet: County seat. Population 1910, 352. One of the earliest settlements in the state was made at this point by the Hudson Bay Company. The little city is situated in a flat at the junction of Birnie creek with the Columbia river and on a low bench to the south. About 8,000 acres of tide lands are in course of reclamation by diking. The local industries include a large fish cannery and sawmill. Logging camps are not far away. City has a county building, two churches, a four-year high school, newspaper, bank, and good water system. Four steamers stop daily each direction.

Deep River: The center of a logging and farming section located on a slough of Columbia river. Tide lands here are very fertile. Two stores, two churches, and school through tenth grade is maintained.

Grays River: A trading center at the head of navigation on Grays river in the northwest part of county. It is the center of a large and prosperous dairy and logging section, where the cost of production of a pound of butter or pork is claimed to be less than elsewhere in the United States. Two creameries and a general store are maintained.

Skamokawa: (Meaning smoky water.) A town of about 350 people, devoted to lumbering, fishing and dairying, located in the south central part of the county at the entrance to three fertile valleys, and overlooking the Columbia river. A cooperative creamery, two churches, a high school and a newspaper are supported.

COWLITZ COUNTY.

Cowlitz county derives its name from the Cowlitz Indians, the original inhabitants of the region. It is located near the southwest corner of the state and is separated from the state of Oregon by the Columbia river, which marks its southwestern boundary line.

Topography: Along both banks of the Cowlitz river, which with its tributaries drains the western and northern part of the county into the Columbia river, and on the right bank of the Columbia are extensive alluvial bottoms of from one to three miles in width. These with more limited areas along the Kalama and the Lewis rivers and their various tributaries comprise the best of the agricultural lands in the county. Tributary to these valleys are rather hilly regions with extensive areas of level to rolling lands which continue till the mountains are reached in the extreme east and northwest corners. About 60 per cent of the county is

rolling to hilly, 20 per cent level, and 20 per cent mountainous.

Soil and Climate: Most of the rolling and hilly surface is covered with what is known as the Olympic silty clay loam, a soil derived from the weathering of the underlying basaltic or andesite rocks. Practically all crops common to this part of the state can be grown at a profit, and it is especially well adapted to dairying. Oats yield from 60 to 100 bushels per acre and potatoes from 150 to 200 bushels. Along the Columbia river a dark silty clay loam prevails, suitable for hay and oats. Above the Cowlitz a dark silty loam predominates, which yields from 60 to 125 bushels of oats and 200 to 400 bushels of potatoes per acre. Rainfall is from 40 to 60 inches. Winters are very mild, freezing temperature being rare. Growing season is about 200 days.

Population: According to the United States census report, there were 12,561 people in the county in 1910, representing an increase of 59.5 per cent in ten years. The 1920 census recorded 11,791, or one for every 62.6 acres of land. Last school census showed 3,706 of school age. Most of the people live in the towns along the railroad, in the Columbia and Cowlitz valleys. Many Germans and Finlanders are included.

Lands: The total area of the county is 737,920 acres, of which 20,239 acres are included in the Columbia Forest Reserve. Unreserved and unappropriated lands amount to only 5,485 acres, while of state school and granted lands there remain about 69,306 acres. This leaves in private ownership over 600,000 acres, nearly half of which is still in timber. Not more than 20,000 acres are improved and the remainder of approximately 300,000 acres is in the logged-off or burnt-off state. Probably 250,000 acres are suitable for cultivation, when cleared, and the remainder will be good for pasture and reforestation. Important in the agricultural development of the county are the diking enterprises, which when completed will have reclaimed many acres of choice bottom land contained in a number of diking districts, along the Columbia and Cowlitz rivers. Over $100,000 was spent on these in 1918.

Prices of Land: Improved valley lands cost from $75 to $300 per acre; unimproved from $25 to $100. Bench lands improved cost $75 to $150, and unimproved $10 to $50. Grazing land can be had for $7 to $10. The highest priced lands are nearest the cities located on the railroads. Twenty acres of the best land is sufficient for a home and living.

Resources and Industries: On the 300,000 acres of private lands, it is estimated that 15 billion board feet of timber are still standing, which will keep the many saw and shingle mills in the county going for years to come. As the trees are cut off much excellent land is available for agriculture which is now represented by dairying, stock raising and fruit culture. There are two creameries and two cheese factories, over 4,000 cows, about 4,000 stock cattle, 21,000 apple trees, 3,200 pear trees, 2,500 cherry trees and 7,000 plum and prune trees. Hay, potatoes, grain, berries, nuts and other vegetables grow successfully. Salmon fishing is carried on in the Columbia river and millions of smelt are caught in the Cowlitz river. Clay is very plentiful and veins of medium lignite coal suitable for briquettes have been discovered close to the Columbia river. Vast water power goes to waste in the Kalama, Toutle, Lewis and Green rivers. About 3,500 horsepower has thus far been developed in the Kalama. Actual value of all taxable property is $31,515,953.

Transportation: Railroads, highways and rivers permit exceptional transportation facilities. The Northern Pacific, Great Northern, and Oregon-Washington railroads bring all the centers within easy reach of the Sound cities and Portland, while the Spokane, Portland and Seattle trains operating on the Oregon side between Portland and Astoria can be reached by ferry. Over 600 miles of highway, including the Pacific Highway paralleling the main railroad lines, encourage the general use of automobiles. Supplementing these modes of travel, Columbia river steamers plying between Portland and Astoria stop at Kalama, and smaller boats navigate the Cowlitz as far as Toledo, and the Lewis river to Woodland.

Educational and Social: There are 61 school districts and seven high

school districts in the county. Various men's, women's and students' organizations are encouraged and churches and fraternal organizations are well supported. There are 405 miles of telegraph wire and 931 miles of telephone, 18 postoffices and six rural routes. A fair is held each September in Woodland.

CITIES, TOWNS AND VILLAGES.

Castlerock: Elevation 59 feet. Population 1920, 839. Located in the beautiful valley of the Cowlitz on the line of three transcontinental railways. It is the starting point for Mt. St. Helens and Spirit Lake. Considerable water power and an extensive area of standing timber is directly tributary. The logged-off lands are fast becoming of agricultural importance. Sustaining industries are lumbering, shingle manufacturing and farming. City has a box factory, creamery of large capacity, and ice plant; also a mile of paved streets, about four miles of sidewalk, volunteer fire company, electric lights and two telephone systems. Five churches, a four-year high school, two newspapers, and a bank are also maintained.

Kalama: County seat. Elevation 21 feet. Population 1910, 816. Census of 1920, 1,228. Situated on the Columbia river and Pacific Highway and served by three transcontinental railways. Steamers run to Astoria and Portland. There is much timber in the vicinity and considerable logging is carried on. It has a cold storage plant, ice manufacturing plant, two shingle mills, large sawmill, two newspapers, a bank, and one of the state fish hatcheries. Much Columbia river salmon is shipped from here. There are four churches, a four-year high school, telegraph and telephone system, paved streets, cement walks, electric lights, piped water and volunteer fire department. A tourist camping ground is also maintained.

Kelso: Altitude 26 feet. Population, 1910 census, 2,039. Census of 1920, 2,228. Situated on the Cowlitz river and the Northern Pacific, Great Northern, and Oregon-Washington railroads, 10 miles north of Kalama and 50 miles north of Portland, Oregon. The first industries were logging and lumbering and the city gained the world-wide distinction for originating the famous ocean-going cigar-shaped log raft for the cheap transportation of logs. At present there are three sawmills and five shingle mills. Fishing for salmon and smelt is also important, there being over 2,000,000 smelt shipped annually. In the future agriculture will be very prominent, for besides cleared and logged-off uplands 10,000 acres of very rich swamp lands are being diked. Dairying, horticulture and general farming are successful enterprises. The city has two banks, eight churches, a four-year high school, four grade schools, a semi-weekly newspaper, city park, paved streets, and good water system. Steamers run to Portland and connections are made by ferry for Astoria trains.

Ostrander: A company town of about 200 population, beautifully located on a hill overlooking the Cowlitz river, 13 miles north of Kalama, and served by three transcontinental railroads. A sawmill employing about 50 men is operated and church and school facilities are provided.

Silver Lake: Elevation 516 feet. A lumber and shingle manufacturing town of about 300 population, 7½ miles northeast of Castle Rock. It is reached by a well-traveled highway, and a railroad logging spur. Much good cut-over land is adjacent.

Woodland: Elevation 53 feet. Population 1920 census, 521; increase 36 per cent. Situated in the southwestern part of the county on the Lewis river, and served by three transcontinental railways and daily steamers to Portland. It is the main trading point for the Lewis river valley, an excellent dairying and farming section, which supports a creamery, cheese factory and several milk stations. Up the river, too, are logging camps and sawmills. City has a bank, weekly paper, a four-year high school, three churches, four garages, electric lights, paved streets, cement walks, water system and electric lights. About 7,000 acres of swamp lands being reclaimed near the city hold splendid possibilities.

CLARKE COUNTY.

Clarke county, named for the great explorer, includes one of the oldest and most highly improved communities in the state, Vancouver, its principal city, being settled by the Hudson Bay Company in 1825.

Topography: The Columbia river bounds it on the west and south and the north fork of the Lewis marks the line dividing it from Cowlitz county on the north. Along the Columbia river is considerable overflow flat river bottom land. Adjacent to this and forming a large proportion of the western and southern parts of the county occurs a series of comparatively level or gently rolling terraces which gradually merge with the more rolling and hilly region to the east. Only the extreme northeastern section, about 15 per cent of the county, is what may be classified as really mountainous territory, the county as a whole being gently rolling to hilly.

Soil and Climate: A number of varieties of soil are found but the bulk of those cultivated are made up of silty loams, silty clay loams, and various types of sandy loams. The best sections are in the western and southern parts. The river bottoms are rich and deep, well suited for late crops. The terrace area is peculiarly adapted to prune culture, dairying, vegetables and general farming. In the more hilly and mountainous sections, stony clay loams are common, excellent for dairying and stock raising. Prevailing winds are from the west and northwest. Precipitation is over 52 inches at La Center and 38.42 inches at Vancouver. Growing season averages 177 days at La Center and 209 around Vancouver. Farther up the Columbia, the precipitation increases and the growing season is slightly longer. The range in temperature throughout the county is very slight from season to season.

Population: The 1910 census records a population of 26,115, or an increase of 95 per cent in 10 years. A healthy growth is still taking place. The 1920 census recorded 32,805, a gain of 6,690 or 25.6 per cent; about two-fifths of them live in the city of Vancouver. School population in 1919 was 8,477. Citizenship is largely American with Scandinavians and Germans following.

Lands: The total area is about 405,760 acres, of which 21,744 acres are state lands, 4,497 acres are unreserved and unappropriated federal lands, and about 600 acres are included in Vancouver Barracks, a United States military reservation. About 60 per cent of the entire county will make good farm land when thoroughly cleared and the remainder will be valuable for grazing. Thus far about 75,000 acres are improved. Of the remainder, 15,000 acres are in timber and about 250,000 logged-off or burnt-over.

Prices of Lands: Unimproved bench lands suitable for grazing may be purchased for from $15 to $25 an acre. If fully adaptable to cultivation it will run from $50 to $100 per acre. Such land finally cleared and ready for the plow runs to $200 and $300 per acre. Valley lands and the best terraces will reach $500 an acre, improved. Some especially desirable pieces of highly improved land with full bearing prune trees will reach $1,000 an acre. Lands may also be leased on satisfactory terms, either for cash or on a percentage basis. It is estimated that 10 acres of fruit land or 40 acres of general farming land is suitable for a home.

Resources and Industries: Besides agricultural lands and a limited acreage of standing timber the county contains some undeveloped coal fields, considerable water power, and opportunities for salmon fishing in the Columbia river. The principal sustaining industries at present, outside the main cities, are lumbering, dairying, horticulture, and diversified farming. The strength of the dairy business is shown by the presence of one condensery, two cheese factories and four creameries. There are about 10,000 milch cows in the county and between 4,000 and 5,000 hogs. Every other class of livestock is represented and poultry is gaining in importance.

This is the leading county in the northwest in plum and prune production, there being about 666,000 trees, or three-fourths of all in the state. There are also about 85,000 apple trees, 27,000 pear trees, and 8,000 cherry trees, and a considerable acreage of grape vines. The raising of English walnuts has been found well adapted to the deep soils

in the Columbia river region. Over 7,000 walnut trees, nearly 2,000 filbert trees and a few almonds, figs, mulberries, quinces, and chestnuts are proving the success of such industries.

Manufacturing is increasing in importance in the vicinity of Vancouver and up the Columbia river to Washougal. Among the most important lines are shipbuilding, paper manufacturing, canning and lumbering.

Transportation and Highways: About 122 miles of steam railroad trackage, 14 miles of electric railway, 1,700 miles of highway, and the Columbia river half encircling the county provide exceptionally good transportation advantages to the region. The main lines of the Northern Pacific, Great Northern and Oregon-Washington railways all use the same tracks north and south and connect the western half of the county with Portland and the Sound cities. The Spokane, Portland & Seattle hugs the north bank of the Columbia river and gives direct communication with Portland and Spokane. The Pacific Highway crosses in a north and south direction, and the North Bank Highway runs east and west. Each of these connects with the extensive county roads reaching the interior parts of the county. An electric road unites Vancouver with Portland and penetrates the country district for several miles to the north. Steamers ply the Columbia to The Dalles, Astoria, and all intermediate points.

Social Conditions: Many historic landmarks associated with the Hudson Bay Company and the early settlements of the Northwest give this section of the state an unique position from a social standpoint. The splendid transportation facilities bring all sections in quick touch with several large cities which are leaders in the Northwest. Telephone communication is supplied to nearly every farm. Mail is distributed by 19 postoffices and 18 rural routes. Churches of all denominations and five private schools are maintained. The county is divided into 77 school districts and 10 high school districts. Community fairs are held in most of these at different times of the year.

CITIES AND TOWNS.

Battle Ground: Altitude 327 feet. A town of about 300 people on the Yacolt branch of the Northern Pacific, 16 miles northeast of Vancouver. It is surrounded by much land adapted to fruits, vegetables and dairying. A cannery has been started and several sawmills operate in the vicinity. City has a bank, picture show house, a four-year high school, and several churches. Stages run to Vancouver and Yacolt.

Camas: Altitude 48 feet. Population 1910, 1,125. Census of 1920, 1,843. Located 14 miles east of Vancouver on the Spokane, Portland & Seattle railway and the North Bank Highway, near the Columbia river. The outlying districts are ideal for fruit raising, dairying and general farming. The principal industry is a large paper and bag factory employing many men. Several sawmills, a creamery, brick-kiln, and stone quarries are also operated, and fishing is important. City has a bank, four-year high school, two newspapers, several churches and fraternities, paved streets, and good water system.

La Center: Altitude 250 feet. Population, 1920 census, 610. Located at the head of navigation on the east fork of the Lewis river, 20 miles north of Vancouver. The surrounding country is devoted to fruit raising, dairying and general farming. Several sawmills and a cannery operate in the vicinity. The town has a bank, four-year high school, three churches, and an Odd Fellows lodge. Transportation is by stage to Vancouver, Ridgefield and Woodland. Steamers run to Portland every second day.

Orchards: A pretty town of about 100 people, located in the midst of a fruit section, six miles east of Vancouver. Prunes, apples, cherries, pears and berries are raised. Two churches, good schools and several fraternal organizations are supported.

Ridgefield: Altitude 60 feet. Population, 1920 census, 620. The city overlooks the Columbia river, 14 miles north of Vancouver. It has a sawmill, shingle mill, several churches, a four-year high school, weekly newspaper and a bank. It is served by three trunk railways and steamers run to Portland.

Vancouver: County seat. Altitude 75 feet. Population, 1910 census, 9,300; 1920 census, 12,637. Area

within incorporated limits, four square miles. This is the oldest city in the state, having been settled by the Hudson Bay Company in 1825. It is backed by all the agricultural and timber resources of Clarke county. Within the city itself are many manufacturing plants. These include four sawmills, three planing mills, a box factory, two iron foundries, brick yard, concrete pipe works, ice and cold storage plant, flour mill, two prune packing plants, a fruit cannery, two bottling works, one steel shipyard building ships of 8,800 tons, one wood shipbuilding plant, a concrete shipbuilding plant, two creameries, a can factory, a refrigerator construction plant, a barrel factory, a knitting mill, and auto signal plant. Being a railroad terminal, about 400 men are employed in the car shops and roundhouse. Here is also located Vancouver Barracks, a military reservation of 640 acres, the United States Land Office and the state school for the deaf and blind. A large new postoffice building has been recently constructed; also an addition to the high school. City supports a Carnegie public library, a large modern hospital, 11 churches, five school buildings, one private academy and two city parks. There are two weekly and one daily paper, four banks, about 11 miles of paved streets, 55 miles of sidewalks and a paid fire department. Electric cars serve city and extend to the interior, also to Portland across a $1,750,000 toll bridge. Four great railroads serve the city and six regular river steamers stop each day.

Washougal: Elevation 48 feet. Population 1920, 765. Located 16 miles east of Vancouver, on the Spokane, Portland & Seattle railroad, near the mouth of the Washougal river. Tributary to it is a large acreage of fertile land devoted to prune culture, dairying, and general farming. Sawmills are also in vicinity. The city has a large woollen mill, two machine shops, a boatbuilding and boat storage yard, a bank, four-year high school, weekly newspaper, and several churches. Columbia river steamers make daily stops.

Yacolt: Elevation 788 feet. Population 1910, 435. Census of 1920, 520. Located on a small prairie at the terminus of a branch of the Northern Pacific railway, 30 miles northeast of Vancouver. Surrounding country is devoted to fruit and vegetable growing. A big sawmill is the main industry. City also has a bank, a four-year high school, three churches, and a newspaper.

SKAMANIA COUNTY.

Skamania county is situated in the heart of the Cascade mountains and most of it is included in the Columbia and Rainier national forest reserves.

Natural Features: It slopes by a series of hills and rolling terraces from the snow-covered summits of Mt. St. Helens and Mt. Adams southward to the Columbia river, which bounds it for 40 miles on the south. Numerous springs from pure snow fields lengthen into streams, which cutting through rolling plateaus and terraces and other heavily forested areas soon unite with the fabled "Oregon," but leave in their wake valleys rich with the decaying debris carried by their waters. Within the lower altitudes of these valleys and along the Columbia river most of the population is found, for all the land held in private ownership is included in the nine townships lying along the southern extremity of the county.

Population: The census of 1920 credited the county with a population of 2,375 or an average of about 1.4 to the square mile. Scandinavians, Turks, Germans and Canadians are represented among the foreign born. This comparatively thin population is due partially to the large forest reserve, but the development of orchards and the building of the North Bank Highway will undoubtedly bring about a faster increase in the future.

Soil and Climate: Several varieties of soil are found, shading from the volcanic ash of the White Salmon and Little Salmon valleys, to the light loams and heavy black loams in the lowlands of the central and western sections of the county, and the various silty, clay and gravelly loams on all the higher levels. In

the eastern part fruit growing has proved especially profitable. The black deep loams of the valleys are particularly well suited for prune culture, hay and general farming, and the central part is adapted to hay and general farming. The annual precipitation is in most parts quite heavy and nearly everywhere sufficient to preclude necessity of irrigation, although in a few places its practice for a brief period during the dry season insures better results.

Lands: Of the entire area, 1,078,400 acres, only 238,555 acres are reported by the county assessor as privately owned. The remaining 840,000 acres include 27,820 acres of state land, 86,000 acres of unreserved and unappropriated federal lands, and over 700,000 of Columbia and Rainier national forest. Altogether, about 6,000 acres are reported as improved, 181,000 acres as privately owned timber, and about 51,000 acres as principally logged-off area. Much of this latter consists of rolling uplands, admirably drained and well suited for agricultural enterprises, particularly horticulture. Most of it was originally held by large timber companies but recently has been subdivided and is now offered for sale to the newcomers. Scattered pieces within the forest are also suitable for agriculture and can be acquired under rigid restrictions.

Prices of Land: Although portions of this county are considered within the favored fruit section of the state, prices have not reached the maximum of other regions, because of the comparative newness of the region. A limited area near the river landings or railway stations is most valuable; if improved, this would be worth from $150 up to $500 an acre. General farm land with improvements sells for about $125. Lands in hay or grain are worth about $150. Unimproved lands range from $10 to $75 per acre.

Resources and Industries: Since reserves are open for mineral entry, considerable prospecting is being done, and many good paying mines of copper and lead have been opened but are awaiting better transportation facilities. About 45,000 apple trees, 12,000 pear trees and many peach, cherry, plum, prune and walnut trees are in bearing. About 40,000 boxes of fruit and 10,000 tons of hay are produced annually. A recent cruise shows that about four billion feet of timber remain on the privately owned lands alone, segregated as follows: Yellow fir, 1,750,000 M.; red fir, 325,000 M.; larch, 150,000 M.; white fir, 725,000 M.; white pine, 150,000 M.; and cedar, 400,000 M.

Water power is plentiful in the Little White Salmon, Wind, Washougal and Lewis rivers, as well as in numerous tributary streams. The total actual value of all assessable property is $12,896,547.

This is also an important region for tourist attractions. The Columbia river and the small streams hastening into it, and the many lakes, all teem with game fish. Native pheasants, Chinese pheasants, blue grouse, quail, deer, elk and bear may be found in the hills. Mineral springs are numerous and attract many health seekers.

Transportation, Highways and Markets: The facilities for moving crops and for travel are ideal along the southern boundary. Every waterfront town has its landing at which several boats stop each day, plying between Portland and The Dalles. The Spokane, Portland & Seattle railway hugs the river bank and provides every station with daily trains. The North Bank Highway, recently completed, paralleling the railroad through the county, is one of the most scenic links in the Evergreen Highway. Other picturesque roads from the interior connect with these main thoroughfares, thus providing convenient access to the markets of Portland, The Dalles, and the Sound cities.

Social: Health resorts at the river towns and at Spirit Lake and elsewhere attract many people who with those permanently located form a happy nucleus for social enjoyment. The completion of the Evergreen Highway brings a steady stream of tourists who stop for a few days to enjoy the scenery or benefit themselves at some of the health resorts. There are 25 school districts, five high schools, 11 postoffices, and one rural route.

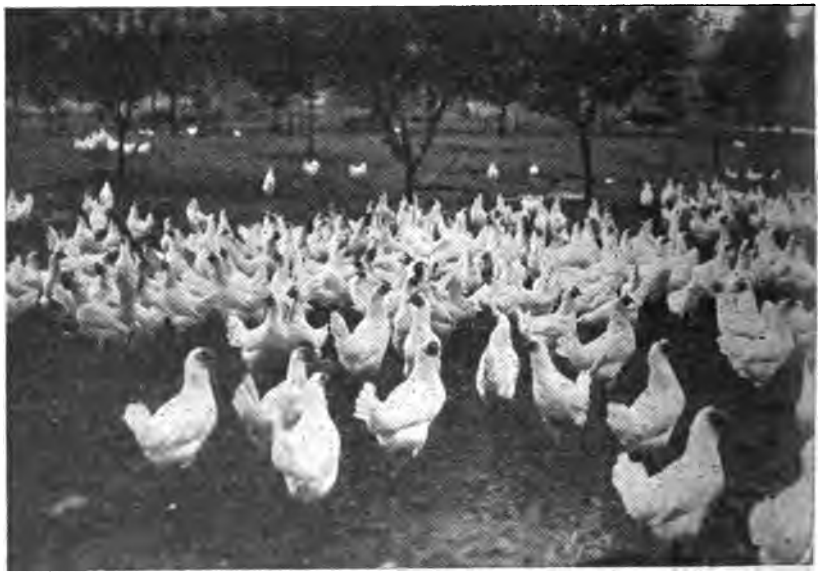
CITIES, TOWNS AND VILLAGES.

Carson: One of the popular mountain resorts of southwest Washington. It is beautifully located at the entrance to the Wind river valley, a mile back from the Columbia river

and the Spokane, Portland & Seattle railway. Two privately owned hot springs are close by and the Government Hot Springs are a few miles north in the forest reserve. Sanitariums are located at each. Lumbering is also carried on and many logs are towed to Cascade Locks, across the river. Gardening, fruit raising, and stock raising are profitable pursuits. A church and high school are maintained.

Stevenson: County seat. Population 1910, 337. Present local estimate 700. It is the only incorporated town in the county and the metropolis of the district. It is picturesquely located in the heart of the Cascade mountains, on the Spokane, Portland & Seattle railway, overlooking the Columbia river, which is crossed by a regular ferry running from this point to Cascade Locks. Several saw and planing mills are operated and dairying and fruit growing are important industries. Mining is a possibility for the future. Medicinal waters are found here and used in connection with one of the hotels. The city has a bank, three garages, newspaper, modern courthouse, four-year high school, several churches and fraternities, electric lights, good streets and pure water supply.

Underwood: An attractive home town of about 200 people, located at the extreme eastern edge of county and at the mouth of the White Salmon river. Fruit growing is the main industry. Church facilities and a four-year high school are provided.



Nearly all parts of the state are ideal for poultry ranches.

Yakima and Wenatchee Valleys.

KLICKITAT COUNTY.

Klickitat county consists of a long, rather narrow, strip of country lying in the south central part of the state between Yakima county and the Columbia river, which flowing for 94 miles along its southern boundary, separates it from the state of Oregon.

Topography: Towards the west, the county extends into the edge of the Cascade mountains and partakes of their magnificent scenery. Eastward it stretches out over the foothills and rolling plains to Benton county and the brown sagebrush hills of the "Horse Heaven." For a considerable distance along its northern edge the picturesque pine and tamarack-clad Simcoe mountains extend, reaching an elevation of 5,000 feet, while the low Columbia range guards the southern limits along the Columbia river. From north to south the county is cut by three important canyons, viz.: Rock Creek canyon in the east central, the Klickitat in the west central, and the White Salmon in the extreme west. Between the Simcoe and Columbia mountains, in ranges 14, 15, 16 and 17, the beautiful Klickitat valley, eight miles in width, extends for nearly 50 miles. This and the White Salmon valley and the rolling hills towards the east constitute the principal agricultural sections of the county. Smaller bodies of good land lie along the banks of the Columbia and a few of the smaller streams.

Population: The 1910 census recorded 10,181 persons living in the county, including many Germans, Scandinavians, Swiss, Danes and English. The 1920 census enumerated 9,268. The largest cities are Goldendale, the county seat, and White Salmon.

Soil and Climate: The soil varies from the rich alluvial loams along the rivers and creek bottoms to red loam and volcanic ash soil on the foothills and higher plains. Volcanic ash soil prevails in the eastern two-thirds, there being some clay loam or black loam with red clay subsoil in the central part. Owing to the geographical position of the county and the marked difference in elevation, there is a wide range of climate. Rainfall varies from 10 to 12 inches in the extreme east to as high as 30 or 35 inches in the White Salmon valley. Farming is usually practiced without irrigation, the moisture being sufficient to produce excellent crops.

Lands: The total area comprises 1,168,000 acres, of which 29,866 are in the Columbia forest reserve, 65,280 are included in the Yakima Indian reservation, 32,584 acres comprise unappropriated timber, agricultural and grazing lands open to homesteaders, and 60,198 acres are state lands. The balance, amounting to over 900,000 acres, are privately owned. About two-fifths of this is in farms, but only about one-fifth has been improved. About 7,500 acres additional of wild land could be cultivated when cleared and nearly 700,000 acres more will be suitable for grazing purposes.

Prices of Land: Unimproved land can be had at prices ranging from $15 to $75 per acre. Improved grain land usually runs from $50 to $100 per acre. Hay lands are around $100 while improved orchard lands run from $200 to $1,000 per acre. The highest priced fruit lands are in the White Salmon valley, where horticultural success rivals the Hood River country. Lands suitable for general farming run from $5 to $60 an acre. Clearing of rough logged-off lands will cost between $25 and $100 an acre. Sagebrush land can be cleared for from $5 to $25. Land may occasionally be leased for one-third the crop. The size of farm required for a family is about 10 acres in the White Salmon valley, 20 to 80 acres around Goldendale, and from 160 to 320 acres in the eastern dryer sections.

Resources and Industries: Agricultural pursuits lead in importance. The principal crop is wheat, which amounts to about a million bushels annually; oats, rye and barley are also produced. Stock raising ranks second. In the spring of 1919 there

were about 60,000 sheep, 15,000 cattle, 7,000 hogs, and many horses. Lumbering is third in importance and horticulture fourth. Commercial apple growing is comparatively a new industry, but its absolute success has been demonstrated in the White Salmon valley, along the Columbia river, and on the sunny southern slopes of the Simcoe foothills. There are about 500,000 apple trees, and many peach and apricot trees. Almond nuts and grapes are also successful crops, particularly near the Columbia river. Practically all fruits, berries and vegetables are successfully raised.

Lumbering is carried on in the western and northern sections where forests of fir, tamarac and pine prevail. About two billion feet still remain uncut.

A vast amount of water power can be developed in the White Salmon, Klickitat and Columbia rivers. Considerable has already been developed in the White Salmon, by the Northwestern Electric Company. Actual value of all taxable property is 36 billion dollars.

Transportation and Highways: The Columbia river is navigable the full length of the county and daily steamboat service in both directions is enjoyed by all river towns and landings. The Spokane, Portland & Seattle railroad, having transcontinental connections and a branch line to Goldendale, parallels the river along the southern edge of the county, and the Oregon-Washington Railway and Navigation Company operates on the Oregon side and can be reached at several points by frequent ferries.

The highways are among the best in the state. The North Bank road, a link in the Evergreen Highway, penetrates the county from the southwest corner to Goldendale and continues to Mabton in Yakima county. Other good roads lead into it, including the famous cement road from Maryhill and an alternate route from White Salmon to Goldendale. Every trading point in the county is easily reached and motor vehicles can operate over some sections the entire year. Regular stages connect the larger centers with the most important interior points.

Markets: Ready markets with fair prices are generally available. The wheat is sold in warehouse and shipped either to the East, or, via Seattle, Tacoma and Portland, to European and other foreign markets. Practically all the commercial fruit is sold in the East. The hay, lumber, dairy products, etc. are usually needed for local consumption.

Social Conditions: The county is divided into 82 school districts and 10 high school districts, with the high schools centrally located for each section. There are 28 post-offices and eight rural routes, and all communities are connected by telephone. The highways are generally hard-surfaced and the use of automobiles is rapidly increasing. Churches, fraternal organizations, women's clubs, granges and other associations are numerous. Regular Chatauqua courses are given and a county fair attracting people from a wide radius is held each fall in Goldendale.

CITIES AND TOWNS.

Alderdale: A new town on the south slope of the Columbia hills, overlooking the Columbia river, 163 miles east of Portland. Splendid opportunities exist for berry and poultry raising under irrigation. Transportation is provided by S., P. & S. trains and by steamers.

Bickleton: Altitude 3,002 feet. A town of about 200 people, 40 miles northeast of Goldendale, in the midst of a rich wheat and stock raising district. The town has a bank, two garages, two churches, a four-year high school, and a weekly newspaper. Good roads extend in all directions and stages run south to Roosevelt located on the S., P. & S. railroad.

Bingen: A town of about 100 people on the Spokane, Portland & Seattle railway, 1½ miles from White Salmon. Truck gardening and fruit raising are successful enterprises. Church and school facilities are ample. Piped water and electric lights are enjoyed. Stages leave here for all points up the White Salmon valley.

Centerville: A town of about 150 people, located on the Goldendale branch of the Spokane, Portland & Seattle railroad. It has a bank, blacksmith shop, two garages, several churches and a high school.

Glenwood: A town of about 100 people, the center of a dairying, farming and sheep raising community in the northwest corner of county, under the shadow of beautiful Mount Adams. In vicinity are two box factories and two sawmills. The town has a garage, picture show, a four-year high school and church facilities. Tourists are attracted here, and a camping site is nearby. Transportation is by stage down the White Salmon.

Goldendale: County seat. Altitude 1,610 feet. Population 1910, 1,203; census of 1920, 1,274. It is located near the center of county, in the heart of the Little Klickitat valley and at the terminus of a branch of the Spokane, Portland & Seattle railway. Just north is one of the largest yellow pine timber belts in the state. Very picturesque is the surrounding country, with three of the most notable mountains in the West in constant view, viz.: Mounts Hood, Adams and St. Helens. The valley itself is very fertile, general farming is practiced and nearly every crop common to the temperate zone is possible. Annual precipitation is about 20 inches and the thermometer seldom drops below zero. In the vicinity are several sawmills. The city itself has two banks, two flouring mills, planing mill, meat packing plant, ice plant, two machine shops, brick yard, two large grain warehouses and a steam laundry. A four-year high school, five churches, two newspapers, five fraternal organizations, a Carnegie library and city park are maintained. Public utilities include electric lights, gravity water, five miles paved streets, 10 miles of sidewalk and a volunteer fire department. County fair is held here each fall. Additional transportation is provided by stages to Maryhill, 10 miles south on the S., P. & S. railroad.

Guler: Altitude 2,005 feet. A town of about 100 population, located in Trout Lake valley, 12 miles south of Mt. Adams and 25 miles north of White Salmon, with which it is connected by daily stage. Lumbering, dairying and stock raising are the principal sustaining industries, but fruits, vegetables and grain are successful. The town has a lumber mill, a co-operative creamery and high school facilities. A new cement road is under construction to connect with the railroad and Columbia river.

Klickitat: A town of about 125 people on the Klickitat river, supported by farming and lumbering. It has a big sawmill and planing mill, a stone quarry and several smaller businesses. Church and school facilities are provided.

Laurel: A small town, 30 miles north of the Columbia river and 15 miles from foot of Mt. Adams. It has a mill and box factory. Farming is increasing. Stages run to White Salmon.

Lyle: Altitude 101 feet. An agricultural center of about 250 people on the Spokane, Portland & Seattle railway and the Columbia river, 32 miles southwest of Goldendale. Grain, hay, sheep, cattle and fruit are shipped. Some lumbering is also carried on. A bank, church and high school are supported.

Trout Lake: A farming center and tourist resort, 25 miles north of White Salmon. The scenic surroundings and interesting geological features attract many pleasure seekers. Dairying is successful and a creamery is supported. Some lumbering is carried on in the vicinity. Good school and church facilities are provided.

White Salmon: Altitude 586 feet. Population 1910, 682. Census of 1920, 619. Area 1¼ square miles. Taxable wealth $900,000. Located on the Columbia river bluffs near the mouth of White Salmon river, 60 miles east of Portland. From its streets, 40 miles of the wonderful Columbia river valley is visible overshadowed by the proud "Guardians of the Columbia," Mounts Hood and Adams. The setting attracts many tourists, for whom two beautiful summer resorts having commanding views of the landscape are maintained. All the leading industries of the county are gradually influencing the growth of this section. The payroll of five lumber companies passes through and apple culture has been placed on a strong commercial basis. Dairying and stock raising are very successful in the valley. The city has a bank, two lumber yards, a weekly paper, picture show house, a four-year high school, four churches, several garages, seven fraternities, volunteer fire department and a modern auto camping park well fitted up with all conveniences and comforts.

developed. A high school, church and two fraternities are maintained.

Prosser: County seat. Altitude 661 feet. Population 1910, 1,298. Census of 1920, 1,697. Incorporated area three square miles. Located on the Northern Pacific and Oregon-Washington railroads, in the western part of the county on the Yakima river, between the Horse Heaven and the Rattlesnake mountains. Many acres of irrigated lands are tributary including one orchard of 250 acres. Its principal industrial plant is a large flour mill. Other enterprises include an ice plant, two banks, four garages, two newspapers, two lumber yards, four apple houses and several hay and grain warehouses. A new dryer has just been built. There are also maintained two banks, a four-year high school, three grade schools, seven churches, four fraternal organizations, public library, and three public parks, one of which is a free auto camping ground. Much horsepower is utilized from the Yakima river.

Richland: Altitude 309 feet. Population, 1920 census, 279. Located just above the mouth of the Yakima river, on west bank of the Columbia. Fruit, alfalfa, dairying and chicken raising are profitable industries and are increasing each year. Land is watered from a gravity ditch taking water out of the Yakima river. City has a bank, garage, four churches, a high school, two fraternities, auto camping grounds, electric lights, and newspaper. Transportation is by stage and boat to Kennewick.

White Bluffs: Altitude 400 feet. The center of an irrigated section on the Columbia river and the Hanford branch of the Chicago, Milwaukee & St. Paul railway. Surrounding country when irrigated is excellent for fruit, dairying and stock raising; peaches, grapes and alfalfa do especially well. On the highlands wheat is raised. It has electric lights, good water supply, a good school, bank, two churches, and a weekly newspaper. Stages and river boats run to Kennewick.

YAKIMA COUNTY.

The name "Yakima" is applied to an Indian tribe, a river, a county and a city. The county is the second largest in the state and includes one of the richest agricultural districts in the Northwest. The river supplies the precious water by which three counties prosper and an empire is developed.

Topography: The county itself is made up of the valleys of the Yakima and its principal tributaries separated from each other by low-lying ridges. These ridges are generally rather barren, or covered with sagebrush, except toward the west where the elevation rises to the timbered heights of the Cascade mountains, whose crest marks the western boundary line of the county. Two of the most important of these ridges approaching from the east and the west separate the county into two nearly equal divisions, both wonderfully rich in natural resources but with some differences in topography and agricultural pursuits. At a point four miles south of Yakima and known as "Union Gap" this ridge has been pierced by the Yakima river which surges through, with the railroads and main highways clinging to its banks.

The most important tributary valleys in the northern half are the Naches, the Atanum, the Cowiche, the Wenas, the Selah and the Moxee, all converging with the main valley not far from the city of Yakima. Their floors are usually level to rolling and vary in width, rising gradually on both sides to the slopes of the guarding ridges.

Below the gap the main valley broadens out and converges with the tributary valleys of Toppenish and Satus creeks and other less important streams, the entire country here giving the impression of a great plain stretching away to the hills in every direction. In this part of the county all the territory lying west of the Yakima river was included in the Yakima Indian reservation, which is gradually being acquired by the whites, who, together with the progressive Indians, are making great headway in stock raising and general farming, and are building up a number of hustling cities. The Wapato irrigation project will eventually water about 120,000 acres of this. That section lying east of the river is occupied by the Sunnyside irrigation project, above which the sagebrush slopes gradually merge with

the Rattlesnake hills, where some wheat is raised.

Population: In 1910 there were 41,709 people in the county, or 209 per cent more than in the year 1900, representing an average of 8.2 to the square mile. A rapid growth is occurring and is certain to continue for many years, since the biggest body of irrigated land in the state is located here and an additional large acreage is irrigable, thus permitting most successful intensive farming and encouraging the development of small tracts. The 1920 census recorded a total of 63,710, an increase of 52.7 per cent in ten years.

Soil: The commonest soil of the county is known as the Yakima sandy loam, often called a volcanic ash loam. It is a mixture of silt and very fine sand and in some places contains a little clay. Pulverized in the hand it is much like soft flour. It is extremely rich in lime content and provided with sufficient soil elements for vigorous plant growth. In the valley regions it varies in depth from 2 to 50 feet and has a gravel subsoil. On the higher elevations it is underlaid with rock or cement. It is easy to till and ideal for irrigation in that it holds moisture from evaporation to a remarkable degree and with few exceptions is sufficiently well drained to prevent the accumulation of large quantities of alkali.

Climate: Some variations must be expected in the climate since the altitude ranges from 700 feet in the valley near the southeastern corner to the heights of the Cascade mountain summits at the western extremity. It is, however, everywhere ideal for man and in the irrigated valleys most favorable to vegetation. The winters are short, with snow on the mountains but scarcely any in the lower levels. Summers are long and uniform and average length of growing season is about 160 days; the sun shines about 300 days out of the year. The mean maximum temperature for July is about 88 degrees and the mean minimum for January about 22 degrees. Violent storms, tornadoes or cyclones are unknown. Total annual precipitation except in the mountains is very low, the records at Sunnyside showing an average of 6.79 inches and at Yakima 7.5 inches. On account of the universal practice of irrigation, a crop failure never occurs.

Lands: The total land area of the county amounts to 3,237,760 acres. Of this, about 800,000 are in the Yakima Indian reservation, 46,240 acres are unappropriated and unreserved, described as "semi-arid, mountainous and timbered"; 122,825 are state lands, and 595,406 are in the Rainier and Columbia forest reserves, leaving in private ownership 799,170 acres, exclusive of city and county lots. In addition to irrigated areas there is also much good land of too high an altitude for irrigation but very useful for grazing and grain production.

Below "Union Gap," besides the private, state and federal lands, pieces of the Yakima Indian reservation are often placed on the market and sold at auction to the highest bidder. Recent prices of such lands range from $5 to $200. This section offers unusual advantages to those desiring to engage in dairying, stock raising, or general farming.

Irrigation: Irrigation has reached its zenith of success in this county and most of the agricultural output is from irrigated lands. Over 200,000 acres in this county, or 40 per cent of all in the state, are at present watered from government and private ditches which divert water from the Yakima river. The largest government units are the Sunnyside and Wapato projects below the "Gap" and the Tieton west of Yakima. Other lands near Yakima were irrigated by private ditches and were the first to show what could be done by water. By the extension of these and other projects and the construction of additional storage, at least 165,000 acres more can be placed under water in this county alone.

Prices of Land: Prices of raw lands irrigable from present ditches range from $50 to $150 an acre, with water rights additional. Improved hay and hop land costs from $150 to $300. Improved orchard lands run from $500 to $1,500, often including dwelling houses and other buildings. There is also much good land with future irrigation prospects which can be bought as low as $10 an acre, but dry lands valuable for immediate farming run from $20 to $40. Mere grazing lands are worth from $2.50 to $7.50. For intensive cultivation, including garden crops, orchards, or small fruits, 10 acres is usually all one man can look after.

Opportunities to buy or lease Indian lands at comparatively low rates are frequent. For hay, dairying or livestock, 40 to 50 acres is ample. Original perpetual water rights cost $52 per acre under the Sunnyside, and $93 per acre under the Tieton; there is also a small annual charge for maintenance. Private projects vary in prices according to the original cost of construction and priority rights.

Agricultural Pursuits: Most of the wealth of this county will always be derived from agriculture. In this respect it is probably unexcelled by any equal area and the future holds great possibilities in store. For diversity, certainty and productiveness of crops and body of land available it probably has no rivals. There is scarcely any branch of agriculture suitable for a temperate zone that cannot be practiced here to advantage. Horticulture, floriculture, farming, stock raising, dairying and apiculture are all successful. The total annual output has for years amounted to between 10 and 15 million dollars, but during the past two, $30,000,000 is nearer the mark.

First in importance is horticulture. Yakima is the leading fruit county of the state, a total of three million trees or a fourth of all in the state are growing in the county. About two-thirds are apple trees, a sixth pear trees and the remainder are made up of 300,000 peach trees, 72,000 plum and prune trees, 9,000 apricot trees and 38,000 cherry trees. Berries, melons, grapes and other miscellaneous horticultural products also do well, some localities rivaling California for vineyards. The total output of fresh fruit for the year 1919 was valued at $20,531,945. Of this, $16,281,382 was derived from apples, $2,222,000 from pears and $1,621,620 from peaches.

Fresh Fruit Output, 1919.

	Number of Standard Packages	*Value*
Apples (boxes)	7,333,956	$16,281,382.32
Pears (boxes)	1,111,000	2,222,000.00
Peaches (boxes)	2,494,800	1,621,620.00
Plums and Prunes (lbs.)	3,276,000	229,320.00
Cherries (lbs.)	3,340,000	334,000.00
Grapes (baskets)	140,000	42,000.00
Cantaloupes (crts)	120,000	270,000.00
Watermelons (tons)	1,800	45,000.00
Total value		$21,045,322.32

This is also the leading hay, potato and corn producing section of the state. Between two and three million bushels of potatoes are raised annually, about 600,000 bushels of corn and 150,000 tons of alfalfa. Wheat, oats and barley are yielded in smaller quantities. A comparatively new industry is the raising of sugar beets which are found very adaptable to all parts of the valley and seem to thrive even where other crops do the poorest.

The dairying advantages of the county are demonstrated by over 11,000 milch cows, and the maintenance of four creameries, four condenseries and two cheese factories. About a million pounds of butter are made each year. Other livestock includes about 23,000 head of stock cattle and nearly 20,000 horses and mules. It has about 125,000 sheep, or a fifth of all in the state, and 19,000 hogs. The total value of all livestock for the year 1919 was about $5,000,000.

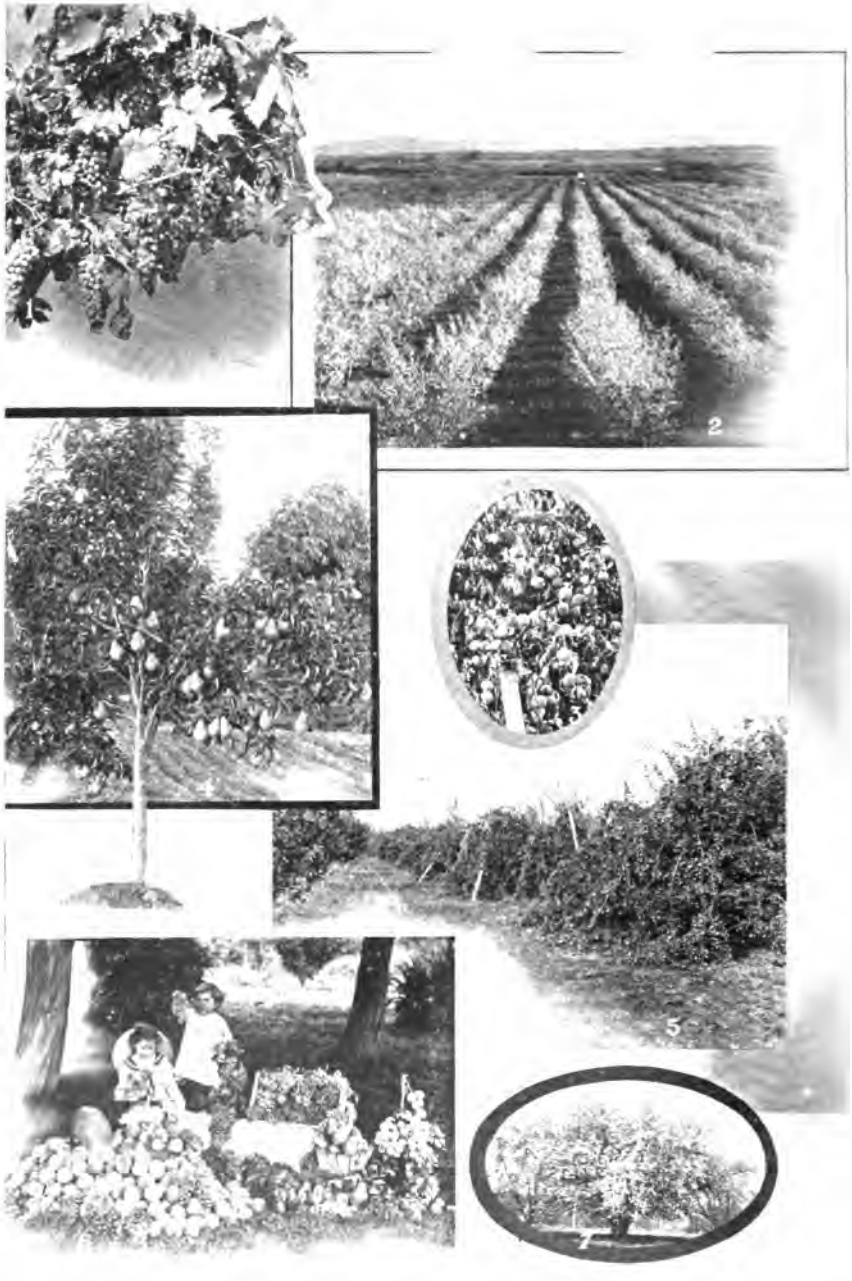
Minerals, Water Power and Timber: Other resources of the county include minerals, water power and timber. Although very little prospecting and no development work has been done it is certain that both precious and useful minerals exist in the Cascades. Of timber there are probably about 400 million feet privately owned and about six billion feet in the forest reserves.

Manufacturing: Sugar, fruit and vegetable products, dairy and livestock products, lumber and spray material are the leading articles manufactured. There are already three million-dollar sugar refineries and several large modern plants which preserve all sorts of fruits and vegetables and make juices, syrups and cider.

Markets: All the surplus hay, potatoes, vegetables, poultry and dairy and animal products, besides much of the fruit, is marketed in the Coast cities. Most of the fruit, however, is shipped east and finds its way into the markets of the world, including Europe and the Orient, where it fetches large prices.

Transportation and Highways: There are altogether about 291 miles of steam railroad track and 44 miles of electric railway. The Northern Pacific main line follows the bank of the Yakima river; the Oregon-

INTAKE OF THE SUNNYSIDE CANAL WHERE WATER FOR 110,000 ACRES IS DIVERTED FROM THE YAKIMA RIVER.



FRUITS OF HIGH QUALITY GROW LUXURIANTLY.

(1) A grape vine. (2) A prune orchard. (3) Peaches. (4) A pear tree.
(5) Bending with apples. (6) Kiddies and fruit. (7) A large cherry tree.

Washington railway parallels it from Yakima to Kennewick, whence it continues to Walla Walla and connects with the main line; and a branch of the Chicago, Milwaukee & St. Paul hugs the Columbia river in the northeastern corner. Branch lines of the Northern Pacific serve the Moxee and Naches valley, and electric lines operate out of Yakima up the Atanum and to other outlying sections.

About 1,700 miles of highway are maintained, 50 miles of which are paved and 160 miles are well gravelled. About 130 miles are state primary highways and include the Sunset, the McClellan Pass and the Inland Empire, all of them main thorofares from the Sound country to Spokane and Walla Walla.

Social Progress: The remarkable increase in wealth, population and transportation facilities have been accompanied by civil, educational and religious advancement. Yakima, the leading city, is thoroughly metropolitan in character and its influence extends to every corner of the county and beyond. Nearly every town is provided with a newspaper, a library, pretty parks, churches, representative fraternal organizations and public service societies. Altogether, 13 newspapers are published; 61 school districts, 20 high school districts, and eight private schools are maintained. There are 32 post-offices and 24 rural routes, about 7,590 motor vehicles, 6,630 miles of telephone wire and 355 miles of telegraph wire.

CITIES AND TOWNS.

Grandview: Altitude 811 feet. Population 1910, 320; 1920 census, 1,011. Located on a sightly eminence, on the Oregon-Washington and Northern Pacific railroads, 40 miles southeast of Yakima and two miles north of the Yakima river. A large area of splendid land is contiguous and large shipments of alfalfa and fruit are made. It has an alfalfa mill, a dryer, two banks, a newspaper, a vulcanizing plant, three garages, two hotels, two movies, a tourist camping ground, a good water system; electric lights, fire department, four churches and a four-year high school.

Granger: Altitude 731 feet. Population 1910, 453; 1920 census, 412. Located on the Northern Pacific and Oregon-Washington railways and the Yakima river, 25 miles southeast of Yakima, within the Sunnyside project. Rich farming and fruit land surrounds it and a large quantity of fruit, hay, grain and vegetables are shipped. It has a clay products plant employing 18 men, a large warehouse, a bank, newspaper, four churches, a four-year high school, public library and park, four fraternal organizations, electric lights, good water, and volunteer fire department.

Mabton: Altitude 715 feet. Population 1910, 666; 1920 census, 547. Located on the Northern Pacific railway, at the edge of the Indian reservation and the Sunnyside irrigation project, a mile from the Yakima river, and 38 miles southeast of Yakima. It is a shipping point also for much of the Horse Heaven country, lying southeast. Land immediately surrounding the town is very fertile and considerable is under irrigation. The city has a rolling mill, grain elevator, theater, a bank, newspaper, four-year high school, public library, auto camping grounds, municipal wells, electric lights, four churches and three garages.

Moxee: Elevation 1,000 feet. An important farming center of about 200 people, located in the rich Moxee valley, at the terminal of the Yakima & Valley railway, nine miles southeast of Yakima. School and church facilities are provided. Stages run to Yakima.

Naches: Altitude 1,500 feet. A prosperous farming center of about 300 people, near the head of the fertile Naches valley, and the terminus of the Yakima & Valley railway, 16 miles northwest of Yakima. Fruit, dairy products, and garden truck are produced. A high school, church, good water supply and electric lights are provided.

Outlook: Elevation 778 feet. A village of about 200 population, located on the Northern Pacific railway, 30 miles southeast of Yakima. Lying under the Sunnyside ditch, much rich irrigable land devoted to fruit and alfalfa surrounds it. Additional land has been recently put under water by a government pumping plant. It has a four-year high

school, two churches, a bank, electric lights and good water supply.

Selah: Altitude 1,108 feet. A town of about 300 population, located on the Northern Pacific main line, the Yakima river, and the Inland Empire Highway, four miles north of Yakima. Back of it is the rich Selah valley highly cultivated and devoted to fruit, alfalfa, hops and livestock. Several large warehouses are located here, also a bank, a newspaper, a four-year high school, several churches, and all subsidiary enterprises. Business streets are paved, also the main highway to Yakima.

Sunnyside: Altitude 747 feet. Population 1910, 1,379; 1920 census, 1,809. Located in the broadest part of the Yakima valley on the Northern Pacific and Oregon-Washington railways, 35 miles southeast of Yakima. It is the metropolis of the Sunnyside reclamation project and an additional 5,000 acres watered by a government pump. The country is ideal for diversified farming; sugar beets, alfalfa, fruits, corn, and livestock are produced to advantage. One of the Utah-Idaho $1,000,000 beet sugar plants and a large flour mill is here. There are also several large warehouses, a fruit and vegetable cannery, two creameries, lumber yard, six garages, two banks, two newspapers, a free auto camping ground, a four-year high school, eight churches, and public library with over 3,000 volumes. All business buildings are of substantial construction, streets are paved and walks are concrete.

Toppenish: Altitude 730 feet. Population 1910, 1,598. Census of 1920, 3,120. Located in the Yakima Indian reservation, on the main line of the Northern Pacific railway, at its junction with the Sunnyside and Fort Simcoe & Western branches, 20 miles southeast of Yakima. It is the largest city in the south half of county and the principal commercial and distributing center of a section yielding heavy returns in potatoes, sugar beets, hay, fruit and livestock, part of which lies within the big Wapato irrigation project. One of the Utah-Idaho million-dollar sugar refineries with a daily capacity of 120 tons of sugar and several important by-products, and one of the largest nurseries in the state are located here. Other industries include rolling mills, a modern ice plant, creamery, cheese factory, milk condensery, concrete pipe factory, machine shops and iron works, several fruit and cold storage warehouses, a grain elevator, a lumber yard, several garages, three banks, and two newspapers. The city maintains a four-year high school, two churches, eight fraternal organizations, a public library, public park, seven miles of paved streets, 20 miles of sidewalk, excellent water and sewerage system and electric lights. Actual value of taxable property is about $1,500,000.

Union Gap: Altitude 930 feet. Population 1910, 263; 1920, 332. Located on the Northern Pacific and Oregon-Washington railways, three miles south of Yakima. Until the advent of the Northern Pacific and the founding of Yakima this was the county metropolis. It is now an important dairying and beet sugar center. One of the Utah-Idaho million-dollar sugar factories, employing about 100 men, is near by.

Wapato: Elevation 850 feet. Population 1910, 400; 1920 census, 1,128. Located on the Yakima river and the Northern Pacific main line, 12 miles southeast of Yakima. It is an active trading point of the Wapato irrigation project, which will eventually water 120,000 acres of first class land. It has a four-year high school, newspaper, bank, five churches, five fraternities and good water supply. Stages operate to Yakima and Toppenish.

White Swan: Altitude 1,100 feet. A town of about 150 population situated in the interior of the Indian reservation amid the verdure of Toppenish creek, 19 miles west of Wapato. Transportation is by a branch of the Northern Pacific railway just completed. The completion of the Simcoe irrigation project will place many acres of land under water. Livestock, general farming and fruit and hop growing are the sustaining industries. It has two churches and good schools, including a U. S. Indian school.

Yakima (formerly North Yakima): County seat. Altitude 1,067 feet. Population 1910, 14,082; 1920 census, 18,539. Area in limits 3.7 square miles. This city is the metropolis of the county and of south-central Washington, and the third

largest city in eastern Washington. It is located near the northern limits of the county and in the heart of the most developed section of the Yakima valley, where a number of rich tributary valleys converge. The valley here is in a high state of cultivation with orchards predominating. The wonderful agricultural development of the valley has influenced the establishment of a number of important concerns for serving the community and utilizing its products to advantage. Among the most important are a big lumber mill employing 300 men; one of the Utah-Idaho company million-dollar plants employing 100 men; a large fruit and vegetable cannery, an evaporating plant, a drying and packing establishment; a processing company, a spray manufacturing concern, two iron foundries, an artificial ice plant, a meat packing plant, two bottling works, five bakeries, a rug works, and many large warehouses. It has three daily newspapers, six banks with deposits exceeding $12,000,000 and two trust companies.

The city has been laid out and built according to modern architectural design. Business buildings are of brick, concrete or stone. It has 17 miles of broad paved streets and 46 miles of sidewalk. It enjoys a splendid water works, sanitary sewer system, gas and electric lights, and a central heating plant for business firms and residences. It maintains a paid fire department with auto trucks; a public library of over 10,000 volumes, a Y. M. C. A., federal building, a commodious courthouse, a $125,000 high school and nine grade schools, several private schools, 20 churches, two hospitals, numerous fraternal buildings and a public park. It is served by the Northern Pacific and Oregon-Washington railways, and is the hub of an interurban system. Over 12 miles of electric railway traverse its streets. Assessed valuation of all property is about $9,000,000.

Zillah: Elevation 821 feet. Population, 1920 census, 645. Located on the north side of Yakima river, on the Northern Pacific and Oregon-Washington railways, 22 miles southeast of Yakima. Fruit, hogs and dairy products are shipped. It has a 600-car capacity cold storage plant which manufactures ice for loading cars and domestic use, and the only precooling plant in the Yakima valley. Town also has a four-year high school, three churches, a newspaper, bank, fruit evaporator, a modern department store, garage, and municipal water works.

KITTITAS COUNTY.

This rather rectangular shaped county occupies a sort of northwesterly-southeasterly position almost central in the state.

Natural Features: Its western boundary line is marked by the crest of the Cascade mountains, whose spur, the Wenatchee mountains, extends along the northern boundary and separates the Kittitas valley from the valley of the Wenatchee river. The western and northwestern sections of the county are practically enveloped by these timber-clad mountains and their foothills which give birth to the wonderful Yakima river and hold a number of large beautiful lakes serving as storage reservoirs to replenish the river during the peak period of irrigation. The south-central section comprises the rich Kittitas valley spreading northeast and eastward toward the dry, treeless, sagebrush hills guarding the western banks of the Columbia river, and westward toward the timbered foothills. Nearly a half of the county may be considered mountainous and the rest level or gently rolling to hilly.

Climate and Soil: There are several varieties of soil, ranging from the gravelly loam in the north end to the rich loams or volcanic ash of wonderful fertility in the central and southern parts. The annual mean precipitation ranges from 9.54 inches at Ellensburg to 24.50 inches at Cle Elum, but increases towards the west as the foothills and mountains are approached. The average length of growing season in the valley is about 130 days. The highlands are devoted principally to the raising of grain or to grazing. In the valley, wherever irrigation is practiced, hay, grain, fruit and vegetables are very successful.

Population: In 1910, the recorded population was 18,561 or 91.3 per

cent more than at the previous census. For 1920 a total of 17,580 was reported. School census in 1919 recorded 5,108 between the ages of 5 and 20, inclusive. Most of the people live in the Kittitas valley and about half in the cities of Ellensburg, Cle Elum and Roslyn. A Danish settlement has grown up near the town of Kittitas, while the mining districts have attracted many Austrians, Hungarians and Itallans. English, Canadians, Scandinavians and Germans are also conspicuous among the foreign population.

Lands: The total area comprises 1,490,560 acres, of which 290,938 are left in the Rainier and Wenatchee forest reserve, 118,073 acres are state lands, and 62,000 acres are unreserved and unappropriated federal lands, described as "semi-arid, mountainous, and timbered." The remainder has passed into private ownership. Of the private lands, 114,000 acres are rated by the county assessor as improved, 176,000 as timbered, and 578,000 as unimproved. About 200,000 acres of the deeded lands are said to be suitable for agriculture. Irrigation is practiced quite extensively, there being now over 70,000 acres under ditches, while the projected high line will irrigate thousands of acres additional.

Prices of Lands: Lands suitable for grazing only may be purchased for as low as $5 an acre. Good non-irrigable land suitable for grain may be purchased for $25 and up. Hay and grain land under irrigation fetches from $200 to $300. Fruit lands go to $500 and higher. All prices of course are affected by proximity to railroads and shipping centers. Five acres of fruit land or 40 acres for mixed farming makes a suitable tract for a home on irrigated lands. Stock and grain farms require 160 acres or more. Opportunities are open for renting on shares.

Agriculture: Agricultural pursuits, coal mining and lumbering are the three main lines of industrial effort. About 70,000 acres of land are watered from the Yakima river and made to yield heavy crops of hay, grain, vegetables, fruits, and dairy and other livestock products. The higher lands are devoted to wheat and other grains or grazing. About 4,000 cows are milked, many of them pure-bred, and three creameries are supported. Over 500,000 pounds of butter are made yearly. About 50,000 sheep were reported in the spring of 1919 and the annual production of wool is around half a million pounds. There are also about 11,000 stock cattle and many hogs, horses and mules. The annual hay output amounts to about 75,000 tons and the grain products to about 500,000 bushels. The principal fruit is apples, there being about 160,000 trees in the county.

Minerals: Coal mining is carried on in the upper county in the vicinity of Cle Elum and Roslyn, the latter city having many miles of tunnels directly underneath and reaching in every direction. About 2,000 men are employed and the yearly output is nearly two million tons, or about half the output of the state. Gold, copper and silver have been mined in a limited degree. Other valuable minerals known to exist are silica, iron, cinnabar, nickel, quicksilver and galena.

Timber: Including both private and public lands, about 300,000 acres of timber lands remain which would indicate the presence of between two and three billion feet of timber. A number of sawmills are in operation and logging operations are carried on by outside milling companies, who float the logs down the Yakima river or transport them by rail.

Water Power: Unlimited water power is available in the Columbia river, which could generate half a million horsepower in this vicinity, while the mountain lakes, with an expenditure of $2,000,000, it has been estimated, would supply power to turn every wheel in Seattle and Tacoma and then be utilized for irrigation purposes.

Transportation and Highways: More than 282 miles of steam railroad trackage, chiefly along the Yakima river, are maintained by the Northern Pacific and Chicago, Milwaukee & St. Paul railroad companies, who operate several through trains daily. Over 600 miles of highway, in good condition throughout the year, including the Sunset and Inland Empire highways, which meet at Ellensburg, make the use of automobiles and stages practicable in every part of the county. The Co-

lumbia river is navigable along the eastern edge of the county limit but no boats are at present operating.

Markets: The proximity of this section to Seattle, Tacoma and other Sound cities which need unlimited quantities of agricultural products, both for home consumption and to supply the heavy Alaska and other domestic trade, insures a ready market for its products. The demand must increase as the world commerce of those cities expands.

Apples and pears are shipped to various parts of the United States and many winter apples are sold in foreign countries. The coal is marketed as far south as San Francisco and as far east as Livingston, Montana.

Social Conditions: The county is divided into 44 school districts and six high school districts. It has 13 postoffices, and four rural routes are maintained. A number of private schools exist and four newspapers are published in the larger centers. There are about 1,620 miles of telephone wire and 664 miles of telegraph wire for the rapid transit of messages. The general prosperity of the people is indicated by the ownership of 1,500 automobiles, 1,000 large musical instruments and the modern conveniences enjoyed in the farm homes. Churches and libraries are encouraged and many organizations exist for social, educational, business and religious progress.

CITIES AND TOWNS.

Cle Elum: Altitude 1,907 feet. Population 1920, 2,661. Located on the Yakima river, on the main lines of the Northern Pacific and Chicago, Milwaukee & St. Paul railways, 25 miles northwest of Ellensburg. Principal sustaining industries are coal mining and lumbering. The output of adjacent as well as Roslyn mines, amounting altogether to nearly 2,000,000 tons annually, is shipped through this city. It is also the outfitting point for miners, prospectors and sheepmen, and thousands of sheep pass through en route to the summer ranges or the winter pastures in the valleys. The city has a sawmill, two banks, a steam laundry, a four-year high school, four churches, eight fraternities, two creameries, a newspaper, three garages, a hospital, electric lights and good water system.

South Cle Elum: Altitude 1,940 feet. A freight division point for the Chicago, Milwaukee & St. Paul railway, which maintains here a roundhouse, carshop and substation for electric power. Coal mines, timber, farm lands and water power are tributary. Population 1920, 587.

Easton: Altitude 2,168 feet. Population, 1920 census, 266. Located on the Northern Pacific and Chicago, Milwaukee & St. Paul railways and the Sunset Highway, 13 miles northwest of Cle Elum. It is the last town before crossing the mountain on the way west. The Northern Pacific maintains a roundhouse and keeps several heavy engines here for helping trains over the mountains. Much unexploited timber land is in the vicinity. A church and high school are maintained.

Ellensburg: County seat. Altitude 1,572 feet. Population 1920, 3,810. Area 760 acres. Located in the south central part of the county on the main line of the Northern Pacific and Chicago, Milwaukee & St. Paul railways. Through the city flows the Yakima river watering 60,000 acres of tributary land. There exist here about equal balance between the interests and pursuits of a modern metropolis and those of a rural trading center. The activity resulting from a Northern Pacific division point with its roundhouse, shops, etc., and the farming of one of the richest large bodies of agricultural land in the Northwest, contribute to its progress and wealth. Dairy products, fruit, grain and livestock are very important. It has three banks, three creameries, two large flour mills, two saw mills, a glove factory, ice and cold storage plant and one daily and one weekly newspaper. Plans are being made for the irrigation of an additional 70,000 acres of land by the construction of the "high line" canal. Actual value of all taxable wealth is $2,277,116. The city has one of the four state normal schools, a modern four-year high school, a private academy, nine churches, a Y. M. C. A. with a paid secretary, a $10,000 Carnegie library with 6,000 volumes, and all leading fraternities. It also has 11½ miles of paved street, 25 miles of cement

walk, municipal water system, electric lights and a paid fire department.

Kittitas: Altitude 1,646 feet. Population, 1920 census, 200. A new town, located in a fertile valley on the Chicago, Milwaukee & St. Paul railway, six miles east of Ellensburg. It has a bank, hardware store, general merchandise store, two churches and a four-year high school. The completion of the proposed high line ditch will naturally mean much to this town for it is located almost in the center of the project.

Ronald: Population 1920, 718. A mining town located at the foot of the Cascade mountains and about two miles from Lake Cle Elum, in the center of the principal coal field of the state. Church and school facilities are adequate.

Roslyn: Altitude 2,218 feet. Population, 1920 census, 2,673. Located on the Roslyn branch of the Northern Pacific railway, 29 miles northwest of Ellensburg. The city is supported almost entirely by coal mining and the population consists principally of foreign races attracted by that enterprise. They include Austrians, Hungarians, Italians, Germans, Russians, Poles, Danes, Scandinavians and Negroes. Over 500,000 tons are taken yearly from two mines beneath the city itself and over 700,000 tons mined at neighboring towns are shipped through. The city is provided with six churches, two grade schools, a four-year high school, weekly newspaper and a public library.

Thorp: Elevation 1,635 feet. A farming community of about 250 people, located on the Northern Pacific and Chicago, Milwaukee & St. Paul railways, 10 miles northwest of Ellensburg. The surrounding country, the oldest irrigated district in the county, is splendid for fruit and hay. Two churches and a four-year high school are maintained.

CHELAN COUNTY.

Chelan is the diamond-shaped county lying on the east slope of the Cascade mountains in the north central part of the state.

Topography: Its principal physical features trend in a northwest-southeast direction. The northern and western townships are occupied by the main ranges of the Cascade mountains, whose crest marks the western boundary line. One of their main spurs, the Wenatchee mountains, guards the southwestern approach and another parallel range marks the northeastern line. Other lower ridges reach into the heart of the county cutting it into several well-defined valleys. Principal of these are the Lake Chelan canyon and the valleys of the Entiat and Wenatchee rivers which flow southeast into the Columbia, separating the county from Douglas on the east. The natural connecting highway between these valleys is the Columbia river canyon. The lowest elevations of the separating ridges are occupied by bench lands and high rolling table lands, suitable for wheat. Between 50 and 60 per cent of the county is mountainous, from 30 to 35 per cent rolling and 10 per cent level. The region as a whole is peculiarly attractive for its summer resort features. Among its pine-clad mountains and foothills are numerous lakes and tortuous streams interrupted with waterfalls and teeming with trout. A most salubrious climate prevails and is a factor in producing the big red apples flourishing throughout the valleys and along the lower slopes. Lake Chelan, from one to two miles wide and 55 miles long, is one of the most fascinating bodies of fresh water in the world.

Population: In 1910 a total of 15,104 people were recorded in the county, representing the remarkable increase of 284.2 per cent in 10 years. A very rapid growth is continuing as the wealth of the region is realized and its resources are developed. The 1920 census recorded 20,906, an increase of 5,802 or 38.4% during the decade. The majority of them live in the Wenatchee and Columbia river valleys. Scandinavians and Germans are prominent among the foreign-born.

Land: Out of the total area of 1,856,000 acres, 1,154,005 acres are taken up by the Chelan and Wenatchee national forest reserves, 46,787 acres are state lands, 20,944 acres are federal lands subject to

homesteading, and the remainder, including 75,000 acres of improved lands, have passed into private ownership. Altogether there are about 200,000 acres suitable for agriculture and the rest could be used for grazing.

Soil, Climate and Water: The soil is composed chiefly of volcanic ash and decomposed granite rock and is from one to thirty feet deep. It is generally rich in lime, well supplied with potash and phosphoric acid, and contains sufficient nitrogen. The valleys and bench lands are best adapted to fruit raising and dairying, the higher lands to grains. The climate is moderate and disturbed by no sudden changes, wind or electric storms. The summers are warm and conducive to tree growth. The winters are mild with very little wind. At Wenatchee the annual precipitation is 13.57 inches, very little of it falling during the summer months; so that irrigation is essential all along the valleys and the lower slopes, but is practiced with the maximum degree of success. Gravity ditches are the most common, although pumping is resorted to in some of the highest places. On the highlands dry farming is generally practiced.

Prices of Land: Prices for unimproved land irrigable from present projects range from $100 to $200 for hay lands and from $400 to $600 for orchard land. Improved orchards cost from $500 to $1,500, although especially desirable pieces will run even higher. Such lands, however, yield good interest on the money invested. From five to ten acres well managed is all that a family needs. Lands beyond any possibility of irrigation and suitable for grain farming and grazing run from $10 to $60 an acre, but the roughest grazing land can be had for as low as $2 to $5 an acre. Opportunities to lease for cash or on shares are frequent. Improvements take into consideration acreage cultivated, the number and age of trees, extent of fences and flumes, the character of buildings, and various other miscellaneous details.

Resources and Industries: This county is famous principally for the production of apples which grow to perfection and net most of the county's income. At the present time there are about one and a quarter million apple trees, principally in the Wenatchee valley, but also along the banks of the Columbia, in the Entiat valley and at the lower end of Lake Chelan. There are also about 83,000 pear trees, 25,000 peach trees, 13,000 plum and prune trees, 16,500 apricot trees and 17,000 cherry trees. The English walnut also grows to perfection in a few places. The total output of all fruit for the county in 1919 amounted to 9,756 carloads valued at about $15,000,000, and netted about $431 per acre to the growers.

Grain, hay, potatoes and other farm products grow well but less attention is paid them. Stock raising is important and dairying is making considerable headway. Two creameries are maintained and the assessor's census shows the presence of about 2,300 milch cows, 2,500 stock cattle, 3,500 horses and 2,300 hogs besides some sheep and poultry.

Since a total of nearly 1,200,000 acres or about two-thirds of the county is included in the forest reserve and privately owned timber lands, lumbering plays an important part. Mining has been developed but little although a large variety of minerals have been found. They include cement materials, clay, limestone, marble, iron, copper, lead, zinc, gold, silver, molybdenum, quicksilver, asbestos and gypsum. There are two state fish hatcheries and the streams and forests are being continually stocked with fish and game birds.

Water Power: The amount of latent water power is startling. It has been roughly estimated that there can be developed in the Chelan river and lake 100,000 horsepower; in the Wenatchee river, 25,000 horsepower; in the Entiat, 15,000 horsepower; in Icicle and Snow creeks, 15,000 horsepower; and in the Columbia, 400,000 horsepower. There are also many smaller streams, with from 100 to 500 horsepower possible.

Transportation and Highways: Nearly all inhabited parts of the county are easily reached by highway or Great Northern trains. The Great Northern Company has 162 miles of trackage which includes the main line serving the Wenatchee valley, the Oroville branch following the Columbia and Okanogan rivers to the northern limits of the state, a branch to Mansfield and Waterville

in Douglas county, and a logging road to Lake Wenatchee. Nearly 700 miles of highway have been built, including some of the most permanent and most scenic in the state. Part of this constitutes a link in the Sunset Highway and an additional section will be a link in the Cascade scenic highway, an alternate route over the Cascade mountains, via the Skykomish valley, soon to be completed. Wenatchee is the headquarters for stage lines running to all parts of the valley or wherever the demand for such service exists. The Columbia river, although navigable, is no longer used for regular passenger service within the limits of this county, but schedules are maintained by Lake Chelan steamers running from Chelan to Manson and Stehekin.

Social Conditions: Social culture and educational development have made substantial advancement thruout the county and reflect the financial success generally obtaining. Fifty-three school districts are maintained, 10 high school districts and several private schools. Six newspapers are published and fraternities and church organizations of every denomination are supported. Mail is distributed through 24 postoffices and eight rural routes, and telephone communications are made possible by 500 miles of wire. Fairs and other competitive exhibitions are held, including regular county fairs and occasionally other important festivals.

CITIES AND TOWNS.

Cashmere: Altitude 797 feet. Population 1910, 625. Census of 1920, 1,114. Located in the very center of the Wenatchee valley, on the Great Northern railway, 12 miles northwest of Wenatchee. Fruit growing is highly developed in the immediate vicinity, which is often called the "Vale of Cashmere." A substantial belt of timber is also not far away. The city has several large warehouses and packing plants, two sawmills, box factory, an evaporating plant, two banks, weekly newspaper, a four-year high school, seven churches, public library, city park, several garages, electric lights, paved streets, cement walks, municipal water system and a paid fire department. Over a thousand carloads of apples are shipped annually. Actual value of taxable property amounts to about $500,000. Auto stages run to Leavenworth and Wenatchee.

Chelan: Altitude about 1,085 feet, about 425 miles above the Columbia river. Population 1910, 682. Census of 1920, 896. Situated at the foot of Lake Chelan, four miles west of the Wenatchee-Oroville branch of the Great Northern railway. It is first of all a summer resort city and is destined to develop along that line, but it is also the center of a rapidly developing orchard section. Grain and timber also contribute to its support. Steamers start from here to Stehekin at the head of the lake. Among other wonders in the vicinity is the Chelan gorge, through which the Chelan river, only four miles long, tumbles 400 feet to the Columbia. The city has a sawmill, two banks, a four-year high school, four churches, weekly newspaper, two hotels, public camping park, electric lights, excellent water and volunteer fire department.

Entiat: A fruit center of about 200 population located on the Great Northern railway and Columbia river at the entrance to the Entiat valley, 19 miles north of Wenatchee. Over 500 cars of apples are shipped yearly and dairying is increasing in importance. The town has a lumber mill and box factory, five warehouses, a packing plant, newspaper, bank, four-year high school, two churches, public library and good water supply.

Lakeside: Altitude 1,091 feet. Population 1910, 222. Census of 1920, 199. Located on south side of Lake Chelan and one of state highways, a mile from Chelan and five miles from the Great Northern railroad. It too is primarily a tourist resort but is also a center for considerable agricultural activity, especially fruit raising. It has good school facilities, a church, piped water and electric lights.

Leavenworth: Altitude 1,165 feet. Population 1910, 1,551. Census of 1920, 1,791. Situated near the upper end of the Wenatchee valley, 22 miles northwest of Wenatchee, on the Great Northern railroad, for which it is an important division point. Two miles away a large electric plant generates power to drive trains through the Cascade tunnel. Nearby fruit raising and dairying are important industries. Timber covers

the surrounding hills and mountains, and mining prospects are numerous. The city has two sawmills with planers, box factories, a creamery, a state fish hatchery, two banks, weekly newspaper, steel plant, several churches, a four-year high school, public park, cement sidewalks, piped water and electric lights. Stages operate to Wenatchee and Blewett.

Manson: A new town located on the east shore of Lake Chelan, eight miles from its mouth. It is a trading point for the Wapato irrigation project comprising about 4,000 acres which in 1919 yielded about $500,000 in fruit, alfalfa and dairy products. Church and school facilities and piped water are provided. Stages and steamers run to Chelan.

Wenatchee: County seat. Altitude 639 feet. Population 1910, 4,050; 1920 census, 6,324. Area 1½ square miles. It is picturesquely located at the confluence of the Wenatchee and Columbia rivers, on the Great Northern main line, halfway between Seattle and Spokane. These two wonderful rivers and the orchards spreading from their brinks and mingling with the outskirts of the city are visible from the principal streets; also the waving fields of golden grain on the surrounding benches and the wooded foothills of the Cascades advancing from the northwest. Its growth is coincident with the development of the Wenatchee district from a sagebrush desert to an orchard paradise. It is now the financial center for north central Washington and the largest city on the Great Northern railway between Spokane and Everett. The "Okanogan" is reached by the Oroville branch and the Big Bend by the main line and a branch to Mansfield. Several thousand carloads of apples and other fruits and much grain are shipped yearly.

In addition to capacious cold storage warehouses and large fruit packing plants, it has several lumber mills and box factories, a flour mill, a large fruit products plant, a brick and tile plant, a bottling works, a fruit cannery, two meat packing establishments and an asbestomine factory. Valuation of all taxable property is $5,711,651.

Among its important institutions and public utilities are three banks, a daily newspaper, a four-year high school, four grade schools, 12 churches, a public library of 3,500 volumes, a Y. M. C. A., two public parks, a commercial club, and a natatorium. Electric lights, gas, paved streets and a paid fire department are provided. Water is piped from the Columbia river and Squilchuck creek.

A suburban home midst peace and plenty.

Okanogan Highlands.

OKANOGAN COUNTY.

This is the largest county in the state and enjoys special distinction because the site of the first white settlement under the American flag in the State of Washington, old Fort Okanogan, is located here.

Topography: The main topographical features are the Okanogan and Methow rivers draining the eastern and western halves of the county, respectively, into the Columbia river bordering it on the south; the mountainous forest reserve occupying most of the western half and part of the northern section; and the Colville Indian reservation occupying the south half, east of the Okanogan river. The extreme western section of the county is occupied by the Cascade mountains. A lower parallel ridge forms the watershed between the Methow and Okanogan valleys and another low parallel ridge occupies the townships along the eastern boundary line.

On either side of the Okanogan are extensive flat valley lands rising by a series of terraces or gently rolling hills to the more hilly and mountainous sections. The higher elevations are covered with commercial timber but the lowest areas in the wild state were covered chiefly with sagebrush or a sprinkling of trees useful chiefly for firewood. The Methow valley for 12 miles from its mouth is a deep, narrow, picturesque gorge, but at Methow it suddenly widens out and soon becomes a level fertile plain, flanked with rolling hills of rich pasture lands which gradually blend with the mountainous ridges. The elevation in the Okanogan valley ranges from 812 feet at Brewster to about 921 feet at Oroville. The Methow valley ranges from 780 feet at its base to 1,765 at Winthrop. The mountains in this locality are from 4,000 to 9,000 feet high.

Numerous lakes and small streams are found throughout the county. The valley lands are generally irrigated and the higher elevations devoted to grain producing and grazing.

Population: This being one of the newest and least developed sections in the state, its population has probably increased at a faster ratio than most of the other counties. The 1910 census gave it 12,887, representing a 175 per cent increase over that of ten years before. The 1920 census gave it 17,094, a gain of 4,207. The next five years will probably bring greater changes as the important development work now under way progresses. Its citizenship is composed largely of men who left the more crowded secti ns of our own state.

Soils: The soils are extremely rich in lime content with ample supply of potash, phosphoric acid and nitrogen. It is generally a black loam from two to fifty feet deep and very fertile. The subsoil in the valleys is usually sufficiently porous to insure excellent drainage and prevent souring. From five to seven tons of alfalfa to the acre are raised on the irrigated lands and profitable crops on the non-irrigable uplands. Corn goes as high as 100 bushels to the acre and peas, oats, wheat, vetch and rye flourish in nearly all parts.

Climate: The climate is well suited to plant growth. Extremes of temperature are unknown. The winter season rarely brings zero weather and little or no snow falls in the lower altitude. Winter days are for the most part bright, crisp and clear. Cloudless sunshiny days are the rule for the summer with nights delightfully cool. Annual precipitation varies according to location, the lowest being along the Okanogan and Columbia rivers and the highest in the mountainous altitudes of the northwest. At Conconully (elevation 2,300) near the center of the county, the annual precipitation is from 12 to 18 inches, mostly in the form of snow with some rain in the spring and fall and occasional showers in the summer. Growing season is about seven months at Brewster and five months at Oroville and Winthrop.

Lands: The total area of the county is 3,341,440 acres. Out of this, the United States holds in present reserves 1,722,131 acres, and of

unappropriated and unreserved lands 82,400 acres. The state holds 70,390 acres and over 600,000 acres are included in the Colville Indian reservation. Of the privately owned lands, 182,472 acres are improved and devoted to grain, hay, orchard, and general farming; 72,169 are still in timber, and 425,000 are unimproved lands devoted at present to grazing.

The irrigated lands lie within or tributary to the Okanogan and the Methow valleys and the grain lands occupy the higher altitudes beyond. About 25 per cent of the area outside the reserves is said to be tillable and the balance well suited to grazing. One of the most important irrigation projects, known as the Methow-Okanogan project, is being surveyed in this county by the State of Washington. If this is carried to completion it means the ultimate irrigation of 40,000 acres of very productive fruit and alfalfa land along the Okanogan valley. Work on the Brewster Flats unit of this will probably begin in the near future.

Prices of Lands: Unimproved lands are purchasable at prices ranging from $10 to $100, according to character and location. Areas fit for grazing only are worth between $5 and $10 an acre. General farming land with improvements cost from $35 up. Improved alfalfa land is worth from $80 to $160. For natural hay the prices are from $12 to $60. Grain lands are worth from $25 to $75, according to altitude. Raw lands suitable for orchards will fetch $50 and up per acre. Bearing orchards are around $1,000.

Resources and Industries: The four basic resources of an interior country are very pronounced in this county. On 1,800,000 acres of timber lands, about five billion feet of tamarack, fir and pine timber remain. A few mills operate to supply the local demand for lumber and boxes. Mineral deposits include gold, copper, lead, zinc, molybdenum, tungsten, manganese, epsom salts and arsenic. The epsom salts plant at Oroville is one of the most important in the country. A number of gold, silver and copper mines have been opened up, but transportation has interfered with their proper development. Clay and cement materials are common throughout the county.

The greatest sources of immediate wealth are at present from livestock, orchards, and grain farms. From earliest time this has been an important stock raising section and will doubtless continue, for the vast forest area provides rich grazing ranges open to all who comply with the Forest Service regulations. It has been estimated that for every acre of irrigated land there are 23 acres of grazing land. A weekly stock train is to be run on the Great Northern railway. In 1919 there were about 35,000 head of cattle, 4,000 milch cows and 14,000 head of sheep in the county.

About 463,000 apple trees, over 12,000 pear trees, 9,000 peach trees and 7,500 plum, prune, apricot and cherry trees, the majority in bearing, are in the county. Between 500,000 and 1,000,000 bushels of wheat, oats and barley are produced annually. Actual valuation of all taxable property is $23,524,616.

Water Power: About 2,200 horsepower has thus far been developed in the Similkameen, the Methow, and Toats Coulee. Additional may be developed in these streams, in the Okanogan and Sinlahekin rivers, and in Salmon and Nespelem creeks.

Transportation, Highways and Markets: In the past, lack of transportation facilities has tended to retard development in this county. For years river boats represented the only means of moving products and necessary supplies. Now, however, three important branches of the Great Northern, with a total trackage of 151 miles, tap the county and converge at Oroville. One comes direct from Spokane, another from Princeton, B. C., and a third, the most important of all for the county as a whole, up the Columbia and Okanogan valleys from Wenatchee. They are equipped with stockyards and other facilities for handling the heavy output of the county.

Some of the best state highways serve the Okanogan and Methow valleys and connect with good county roads penetrating to all settlements or farm communities. The Methow valley is served by regular daily stages which connect with trains at Pateros. River transportation is still used during high water from Wenatchee to Riverside and Pateros to points on the Columbia. The apples find their way to Chicago and

New York and beef cattle to Seattle, St. Paul and Chicago.

Social Conditions: Schools and churches are found wherever they can be supported. Civic clubs and fraternal organizations are found in the larger settlements. Local fairs, school contests, and various festivities are held from time to time and visited by all the people of the community. Numerous stockmen's associations and producers' associations and several granges and women's clubs are located at central points. There are 12 newspapers, 1,472 miles of telephone, 75 school districts, 13 high schools, 33 postoffices, 11 rural routes and about 1,000 automobiles.

CITIES AND TOWNS.

Brewster: Altitude 800 feet. Population 1910 census, 296. Census of 1920, 394. This little city occupies a level bench overlooking the Columbia river, a mile below the mouth of the Okanogan, where a monument marks the site of old Fort Okanogan, first white settlement in the State of Washington under the American flag. Horticulture, stock raising and lumbering are important industries in the vicinity. Several lumber mills are in operation and many trees are in bearing. Apples raised here took first prize at the World's Fair in San Francisco. A state project is about to put more land under irrigation in the vicinity. Transportation is provided by Great Northern trains and stages to Bridgeport and Pateros. It has a bank, newspaper, blacksmith shop, two garages, two cooperative apple warehouses, a high school, four churches, electric lights and good water supply.

Chesaw: Altitude 2,927 feet. A town of about 150 population, located in a beautiful valley at the confluence of Myers and Mary Ann creeks, three miles from the Great Northern railway in the northeastern part of the county. Grain, cattle and sheep raising, lumbering and mining are principal industries. Railroad ties and iron ore are shipped. Much timber and low grade ore await development. Town has a high school and two churches.

Conconully: Altitude 2,358 feet. Population 1920, 270. An old mining town and former county seat, settled in 1888, 16 miles west of Riverside, the nearest railroad shipping point. Some mining and prospecting is still carried on. It has a bank, high school, church, electric lights and various community businesses.

Loomis: Altitude 1,306 feet. A mining village of about 250 people, prettily located on Sinlahekin river, in north central part of county about 16 miles from Tonasket and Oroville, to which cities daily stages run. Irrigation is practiced with water from Sinlahekin river and Toats coulee, and the White Stone project holds possibilities for much additional development. Many beef cattle are shipped yearly. It has a bank, church and good school facilities.

Malott: Elevation 815 feet. A farming village on the Great Northern railway, eight miles south of Okanogan, and the trading point for "Boston Heights" and other territory. A $13,000 bridge has been built across the river at this point. A sawmill is operated in vicinity.

Methow: Altitude 1,158 feet. An attractive farming village on the Methow river, 12 miles from Pateros and the Great Northern railroad. Splendid commercial apples are raised on the irrigated lands and grain on the uplands. Gold, copper and antimony have been discovered in the hills. Church and school facilities are provided. Stages run to Pateros and Twisp.

Molson: Elevation 3,683 feet. A town of about 350 people located on the Great Northern railway, 25 miles east of Oroville. Wheat raising is the sustaining industry, but mining is also carried on. It has a bank, weekly paper, good school and a church.

Nespelem: Altitude 1,800 feet. Population 200. An Indian village and mining center located in the rich Nespelem valley on the southeast corner of the Okanogan Indian reservation. Several gold and silver mines are in operation in the vicinity and large developments are expected. Town has garage, drug store, meat market, two hotels and a general merchandise store. The Indian agency for the Colville reservation is two miles away.

Okanogan: County seat. Altitude 829 feet. Population 1910, 611. Census of 1920, 1,115. Located on the Great Northern railway and Okanogan river, 92 miles north of

Wenatchee. Surrounded by an excellent fruit growing district and timber and grain land. Much is now under irrigation and a state project has been approved for the irrigation of much more. A flour mill and several small saw and planing mills are in vicinity. The city has a modern courthouse, a national bank, a four-year high school, four churches, public library, two parks, weekly newspaper, several garages, good water system and a fire department.

Omak: Altitude 858 feet. Population about 480. Located on the Great Northern railway and Okanogan river in the center of the state Okanogan irrigation district, four miles north of Okanogan. Horticulture and general ranching are the sustaining industries. Livestock products and wheat yields of the Okanogan reservation find their outlet here. City has a box factory, concrete products plant, two banks, two large apple warehouses and packing plants, three garages, newspaper, two churches, a four-year high school, public library, public park and piped water.

Oroville: Altitude 921 feet. Population 1910, 490. Census for 1920, 1,013. Located on the Okanogan river and Great Northern railway, at the mouth of the Similkameen, five miles south of the international boundary line. It is fortunately located both as to resources and transportation facilities. Three distinct railway branches converge here and the highway from Wenatchee connects here with the Canadian system of roads. The Okanogan valley irrigation district of which about 12,000 acres are under water is tributary and has just voted $450,000 worth of improvement bonds. A new dam and power site is being constructed by the Okanogan Valley Light & Power Company, at a cost of $250,000, and $2,000,000 is to be spent on a British Columbia irrigation project also tributary to Oroville. Nearby is an epsom salts mine which ships from 50 to 100 tons of salts weekly, besides other mining properties. Community industries and utilities include two banks, railway machine shops, a creamery, a four-year high school, four churches, weekly newspaper, modern hotels, a public library and cement walks.

Pateros: Altitude 780 feet. Population, 1920 census, 412. Located on the Columbia river and Great Northern railway, at the mouth of the Methow valley, 60 miles northeast of Wenatchee. Considerable irrigated land devoted to fruit and alfalfa and much dry farming land is in the vicinity and more will soon be irrigated, for it is in the heart of the proposed Okanogan-Methow irrigation project. Many cattle from the Methow valley are shipped at this point. The town has a creamery, bank, a high school, three churches, a newspaper, public library, public park and municipal water system. Value of taxable wealth is $600,000.

Riverside: Altitude 862 feet. Population, 1920 census, 209. Beautifully spread along the banks of the Okanogan river, 36 miles south of Oroville. The contrast between its green fields and orchards and the rugged hills rising abruptly to the bench lands above is impressive. Tributary to it are four farming valleys besides the fertile bench lands. It is one of the leading towns of the county in the export of hogs and cattle, and large quantities of sheep and fruit are also shipped. Splendid possibilities are in store, especially when the new Okanogan-Methow irrigation project is completed, which will water about 7,000 acres adjoining the town. It has a lumber yard, two garages, blacksmith shop, bank, hospital, high school, church, newspaper, public library, city park and good public utilities.

Tonasket: Altitude 910 feet. A growing city of about 300 population, located 110 miles north of Wenatchee and 20 miles south of the international boundary line, in the center of a rich diversified farming district, recognized as a frost-proof fruit belt. It is a trading center for the Okanogan, the Whitestone and the Bonaparte irrigation districts and a large portion of the Okanogan highlands. Within a radius of four miles, several fertile valleys join with the Okanogan. Its principal industries are a flour mill and a creamery, whose products together exceed $250,000 annually. Exports of grain and livestock bring shipments up to $1,000,000 a year. Town has a box factory, two banks, several hotels and garages, two large grain warehouses, a theater, a four-year high school, three churches.

newspaper, public park, library, and all necessary public utilities.

Twisp: Altitude 1,619 feet. Population 1910, 227; 1920 census, 289. Situated near the center of the Methow valley where the Twisp river joins the Methow. Diversified farming and fruit growing are successfully practiced and many beef cattle are shipped. Sawmills and valuable mines are in the vicinity. It has a bank, two large creameries, two churches and a weekly newspaper. The Methow valley fair is held here annually. Transportation is by stage to Pateros, the nearest railroad point.

Winthrop: Altitude 1,765 feet. Population about 200. Situated at the junction of the forks of the Methow, 42 miles from Pateros, nearest railroad point. It is the trading point for a rich dairying, stock and fruit region. A creamery and an ice and cold storage plant are maintained and many cattle are shipped. Sawmills are in the vicinity. It has a bank, high school and church. Daily stages run to Pateros and Mazama.

FERRY COUNTY.

Ferry county occupies the middle portion of the region known as the Okanogan Highlands in the northeastern part of the state and extends from Lincoln county to the Canadian boundary line.

Topography: Its surface presents a beautiful combination of mountains, rolling hills, and low ridges, interspersed with valleys, green fields, streams and lakes. The mountains group themselves into two low ranges extending north and south, separated by the Curlew valley from Republic north, and by the San Poil valley from Republic south. The northern townships drain directly into the Curlew and Kettle rivers, but the remainder, representing about two-thirds of the total area, drains into the San Poil river or directly into the Columbia, forming the southern and most of the eastern boundary. Water thus more than half encircles the entire county. The Kettle river and Curlew valleys have at present received most of the development, although nearly all parts are liberally endowed with latent resources.

Soil and Climate: Soil in the valleys and on the Columbia slope is a fine black sandy loam from one to five feet in depth. The higher lands consist of clay and gravelly loams, rich in the principal plant elements. Alfalfa and timothy hay are the main crops, but a limited quantity of oats, wheat, barley, vegetables, berries and fruits are also produced and in some places are especially prolific. The average precipitation is about 22 inches. Around Republic the period free from frosts is comparatively short, but the crops mentioned have ample opportunity to mature.

Lands: The total land area of the county is 1,420,800 acres. Less than 200,000 acres have thus far passed into private ownership. Of the remainder, 21,784 acres belong to the state; 190,883 acres comprise unreserved and unappropriated federal lands, described as "timber, mining and grazing"; 463,955 acres are included in the forest reserve, and the rest lies within the Colville Indian reservation. Of the privately held lands, not more than 20,000 acres are improved and 71,000 acres are timber lands. Altogether 44,000 acres have been fenced.

Prices of Land: Land prices are comparatively low. Considerable area in the rough state may be had for $7 to $15, the cost of clearing being estimated at $10 to $50. General farm lands bring from $25 to $100 or may be leased on a basis of one-third cash to the owner. Irrigated orchard lands will of course go much higher. Hay lands are worth about $50 and grain about $25. Cultivated Indian allotments can be leased for a term of from one to five years at 50 cents per annum. Stock may be pastured in the forest reserve at certain low prices per head fixed by the government.

Resources and Industries: Timber, water power and minerals are important in this county, in addition to agricultural lands. There are about six billion board feet of timber in the reserve and about one and a half billion board feet on the private lands. Unlimited water power exists in the Columbia, Kettle and San Poil

rivers and their numerous tributaries. Only about 1,500 horsepower has thus far been developed. Gold, silver and copper mining are important industries; about three-fourths of the state's gold output, two-thirds of the silver, and about a third of the copper are produced.

Agricultural pursuits include horticulture, grain farming, dairying, stock raising and truck gardening. Dairying and stock raising are the most important, for the reserves contain much good pasturage which is utilized quite extensively. Nearly 2,000 milch cows and 5,000 stock cattle were assessed in 1919, besides many horses, sheep and hogs. Sheep and cattle are brought from other parts to pasture. In 1919 permits were issued by the U. S. Forest Supervisor to the Curlew valley district for pasturing 8,500 head of cattle, 250 horses, 42,000 sheep and 130,000 lambs. About 28,000 apple trees, 7,500 pear trees, 1,800 cherry trees, and 1,000 plum and prune trees are growing in the principal valleys.

No section in the state offers better opportunities for camping and hunting and many people are attracted from the cities on account of such pastimes. Mule-deer and white-tailed deer, black bears, upland birds, and all kinds of trout are plentiful and campers are encouraged by many romantic spots set apart for pleasure seekers by the U. S. Forest Service.

Transportation and Markets: The northern part of this territory as far south as Republic in the interior and Boyds on the eastern boundary line, is served by the Great Northern and Spokane & British Columbia railroads, which together operate 125 miles in the county; but the remainder is without any direct rail service. A good highway, however, follows the San Poil valley from the Columbia river to Republic and there joins the main highway, which reaches the Colville valley by way of British Columbia. The Columbia river is navigable from Kettle Falls all the way to Wenatchee but is used very little at present.

Republic, Spokane and the cities of British Columbia furnish the principal markets for surplus products.

Population: Being hemmed in by the reserve, the population cannot increase here as fast as elsewhere. In 1910 there were 4,800 people, or 238 more than 10 years previous. The 1920 census credited it with 5,143, living principally in the Curlew and Kettle river valleys.

Social Conditions: Mail service is supplied by 15 postoffices and two rural routes, one to the north and the other to the south of Republic. Education is within reach of all through 30 school districts and two high school districts. About 237 miles of telephone wire connects the leading centers. Newspapers are published at Keller and Republic.

CITIES AND TOWNS.

Curlew: Altitude 1,791 feet. A dairying center of about 150 people, located on the Kettle river, 15 miles south of the international boundary line, and served by the Great Northern and Spokane & British Columbia railroads. Dairying, stock raising and lumbering are important in the vicinity. A creamery, two churches and a four-year high school are maintained. Pure water is piped from a mountain stream. Assessed wealth is about $150,000.

Danville: Elevation 1,738 feet. A town of about 100 population, located on the Spokane & British Columbia and Great Northern railroads, at the international boundary line. Farming and stock raising pursuits are followed in the surrounding country.

Keller: Altitude 1,250 feet. A village of about 150 people, located in a narrow valley, on the San Poil river, seven miles from its mouth. Considerable grain is raised on the surrounding hills, and some gold, silver and copper mining is carried on. Much yellow pine timber, too, is tributary. It has four stores, a garage, blacksmith shop, newspaper, sawmill, a hotel and good school, also a big smelter which is at present inactive. During the salmon season several hundred Indians camp around the town and give it a very western aspect. Transportation is by stage to Wilbur on the Washington Central railway, but a good road also extends to Republic.

Orient: Altitude 1,441 feet. A town of about 150 people, located on the Great Northern railway and the Kettle river near the northeastern corner of the county. It is supported by metal mining, lumbering,

dairying, stock raising and grain. It has a bank, good school, and water piped from a mountain stream.

Republic: County seat. Altitude 2,503 feet. Population 1920, 781. It is a terminus of the G. N. and Spokane & British Columbia railroads, beautifully situated among the hills covered with clusters of pine, fir and tamarack timber, about 25 miles south of the international boundary line. The city was started in 1896 as a mining town and mining has been the principal industry ever since. About three-fourths of the state's output of gold, one-fourth of the silver and a large proportion of copper are taken from the mines in this vicinity. Within the city are two cyanide ore reduction plants, a bank, four churches, weekly newspaper, electric lights, gravity water system, and several garages. Some sawmills operate in the vicinity. The surrounding territory is being devoted to dairying and fruit raising.

STEVENS COUNTY.

Stevens county originally comprised in addition to its present territory what is now Ferry county, lying west of the Columbia and Kettle rivers, and Pend Oreille county, extending from its eastern boundary line to Idaho.

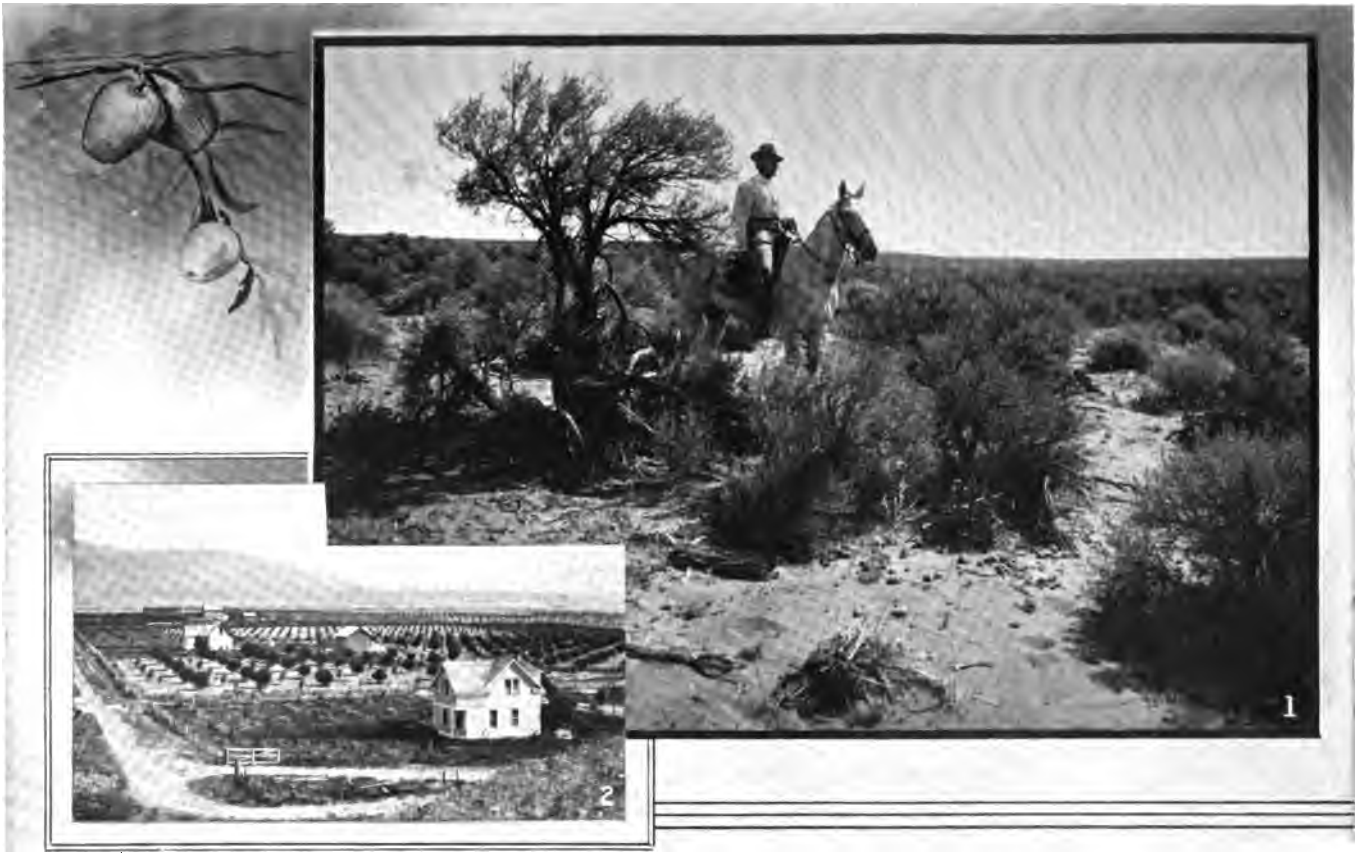
Topography: The Columbia-Kettle river valley and the Colville-Chamokane valley carve a capital K-shaped figure on the surface of this county, the intervening areas being occupied by the river terraces, plateaus, hills, mountain ranges and smaller tributary valleys. The Colville-Chamokane valley extends from the southeast corner in a general northwest direction to the mouth of the Kettle river and its floor is from one to three miles wide. The Columbia-Kettle valley forming the back and upper turn of the "K" is deep-cut and its floor is comparatively narrow. The west slope of the Kalispell mountains, from 5,000 to 5,500 feet in altitude, occupies the eastern section of the county, while the Huckleberry mountains, with an average elevation of 4,500 feet, occupy much of the western area, reaching from the Canadian boundary southward till they meet the broad plateau which spreads out from the Spokane river, bounding the county on the south.

Practically the entire county, with the exception of a few prairies, was once covered with timber, but many acres have been cleared and devoted to agriculture. Many pretty lakes dot the surface, and together with the green forests, mountains, streams and valleys, impress the visitor with the scenic setting and summer resort features of the region.

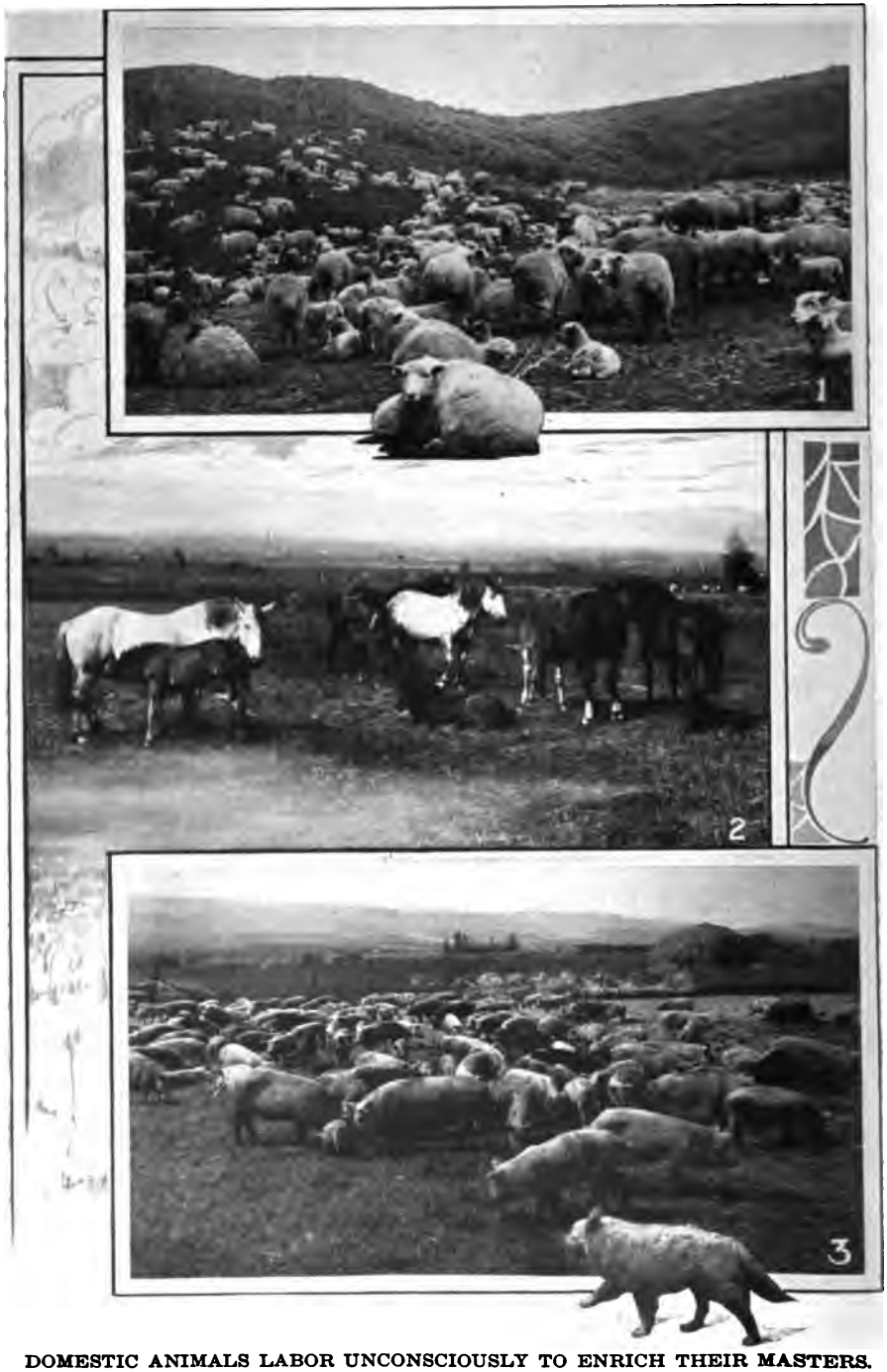
Soil and Climate: Along the river valleys the soil partakes of the nature of various types of heavy black silty and clay loams, with the exception of an occasional peat bed here and there. The subsoil is yellowish clay. The bench lands also have much silt but also a large percentage of clay, fine sand, or gravel. Varying combinations of these with different subsoils and drainage facilities, produce a number of soils that are very suitable for hay, grain, fruits and vegetables. Oats yield as high as 100 bushels to the acre, wheat 20 to 50 bushels and alfalfa 3 or 7 tons per acre. Precipitation is from 17 to 25 inches yearly. Very little cold weather is experienced in winter and the summers are free from extreme heat. Growing season at Colville is 134 days.

Lands: The total area of the county is 1,575,680 acres. Of this, 55,082 acres are included in the Colville national forest reserve; 112,227 acres are unappropriated and unreserved government lands, described as "timbered, farming, grazing or mineral"; and 114,617 acres are state, school and granted lands, subject to purchase. This leaves more than a million acres in private ownership, about 100,000 acres of which have been placed under cultivation; 180,000 are still classed as timber lands; 800,000 acres are logged-off; and the remainder consists of city lots, unpatented homesteads, and other non-taxable areas.

Much of the county holds splendid prospects for agricultural development, especially for dairying and all related industries and for horticulture. The bulk of the agricultural



FROM DESERT TO FRUITFUL ORCHARD.
(1) A type of Eastern Washington volcanic ash soil. (2) A young orchard.



DOMESTIC ANIMALS LABOR UNCONSCIOUSLY TO ENRICH THEIR MASTERS.

(1) Sheep in their summer home. (2) Contented wellbred horses. (3) Pigs in clover.

land lies along the Colville valley, but there is also considerable along the Columbia and Kettle rivers. In the Columbia river valley irrigation is practiced quite extensively and much fruit is raised in addition to hay and grain.

Prices of Land: No section in the Northwest presents better opportunities to acquire cheap first class lands than this county. Prices for unimproved areas range from $5 to $50, the highest prices being for valley lands. Prices for improved valley lands range from $50 to $150, governed by the nature of improvements and distance from railroads. Bench and prairie lands may be had for from $30 to $75. Improved irrigated lands will bring from $150 to $400 an acre, orchards fetching the highest prices.

Resources and Industries: About three billion feet of standing timber yet remain in the county, which will be sufficient to keep the present mills going for many years. Gradually, however, the logged-off area is increasing and opening up big possibilities for general farming, stock raising and dairying. There are now about 5,000 milch cows and an equal number of stock cattle; also many thorobred horses. The 1919 census of the county assessor enumerated about 4,000 hogs and 7,000 sheep. Horticulture is represented by about 33,000 apple trees, 23,000 pear trees and about 33,000 peach, cherry, plum and prune trees. Probably the principal market crops are timothy and alfalfa, but about 175,000 bushels of potatoes, 200,000 bushels of oats, 60,000 bushels of corn and much barley, wheat and rye are also raised.

The mineral resources play a very important part in the county, particularly copper and lead. Over a million and a half pounds of copper and about 10 million pounds of lead are produced annually; also considerable gold, silver and zinc. Tungsten, limestone, marble, lime flux, granite, magnesite, dolomite, clay and cement materials are also found. The marble includes colors ranging from pure white to blue. Water power is unlimited and practically undeveloped, the greatest power being in the Columbia river at Kettle Falls.

Manufactures include lumber, clay products, magnesite and various miscellaneous products. The county has eight banks with deposits amounting to about $3,000,000. Total assessed valuation of all taxable property is $13,200,674.

Transportation and Highways: About 142 miles of Great Northern track traverse the county from Clayton in the southeastern corner to Boundary on the Canadian line. Two daily passenger trains are operated each direction on the Colville valley and one each up the Kettle and Columbia valleys. The Central Washington Highway, a state thorofare from Spokane, follows the Colville valley from the southeast to the northwest. State road No. 7, which starts at Orient in Ferry county, crosses into Pend Oreille county and follows the Pend Oreille valley down to Newport, on the Idaho state line, whence connection is made for Spokane. The Columbia river, is navigable below Kettle Falls and will be valuable for freight.

Population: The combined population for Stevens and Pend Oreille counties was 25,297 in 1910. It is estimated that nearly 5,000 belonged to Pend Oreille county, leaving about 20,000 to Stevens. According to the 1920 census there are now 21,605 in Stevens county alone. School population in 1919 was 6,178.

Social Conditions: A high social standard prevails and general prosperity is very noticeable. There are about 2,000 automobiles, 1,000 pianos, and 6,000 miscellaneous musical instruments. Mail service is rendered by 39 postoffices and 14 rural routes. The county is divided into 123 school districts, 15 high schools and three private schools being maintained. Fraternities, organizations, commercial clubs, churches of all denominations and newspapers are located in most of the towns. About 1,725 miles of telephone wire aid in rapid communication.

CITIES AND TOWNS.

Addy: A town of about 250 people, a few miles south of Colville and devoted to lumbering, dairying and general farming. Two churches and good school facilities are provided.

Bluecreek: A town of about 100 population, 60 miles north of Spokane, devoted to lumber manufacturing and mining. Good agricultural

land is in vicinity. Stages run to Spokane.

Bossburg: Elevation 1,356 feet. A town of about 125, nine miles northeast of Marcus, located on Northport branch of Great Northern railroad. Agriculture and horticulture are main pursuits. Church and school facilities are provided. A Columbia river ferry is maintained here.

Chewelah: Altitude 1,669 feet. Population 1910, 823. Census of 1920, 1,288. Town is located on the Oroville branch of the Great Northern railroad, in the Colville valley, 23 miles south of Colville. Much fertile dairy, grazing and fruit land surrounds it and presents excellent opportunities to the investor or homeseeker. Lumbering, copper and gold mining, brick making and the manufacturing of magnesite are among the industries which, in addition to farming, have contributed towards a rapid growth. Buildings are all substantial and chiefly of brick or cement. City has two banks, a weekly paper, six churches, a four-year high school, five fraternities, municipal water system, electric lights, paved streets and city park. Good opportunities exist for dairying and creameries.

Clayton: Altitude 2,252 feet. Estimated population 350. Located in the midst of a good dairy and fruit section, 31 miles north of Spokane, on the Great Northern railway. Main industries consist of a big brick, lime and terra cotta plant, employing 100 men. Town payroll amounts to about $15,000 monthly. Yearly output of manufactures amounts to about $500,000. Some sawmills are in the vicinity. A four-year high school, two churches and a farmers' grange are supported.

Colville: County seat. Altitude 1,579 feet. Population 1910, 1,512. The 1920 census records 1,796. City is beautifully situated on a bench overlooking the broad Colville valley to the west and south, with higher benches rising toward the low mountains on the north and east. It is the center of a very productive fruit raising, mining and timber section on the Great Northern railroad, 87 miles north of Spokane, and has direct telegraph and telephone connections with Spokane, and with Rossland and Nelson, in British Columbia. New industries are being added from time to time. Mining activities are increasing, farming is being put on business basis, and dairying has developed 900 per cent in eight years.

The city has three banks, a large flouring mill, creamery, brick yard, cement block factory, fish hatchery, shingle mill, a big sawmill and dry kiln, and a number of other sawmills in the immediate vicinity. It also supports two newspapers, two first class hotels, a hospital, nine churches, ten fraternal organizations, a modern high school, a public library, public park of 12 acres, and a paid fire department. Actual valuation of all taxable property is $1,091,536.

Gifford: A small trading center on the Columbia river, 23 miles south of Kettle Falls. Surrounding country is devoted to farming, lumbering and mining. A flour mill is being built. Stages run to Kettle Falls, Addy and Davenport.

Hunters: Altitude 1,610 feet. A town of about 200 people, located near the Columbia river in the southwest part of county. Principal transportation is by stage to Springdale, 28 miles east. River boats also operate. Much good land surrounds it, adaptable either with or without irrigation to fruit, dairying and diversified farming. Much cream is shipped out. A newspaper, high school, two churches, and electric lights are provided.

Kettle Falls: Elevation 1,607 feet. Population 1920, 276. Located in the midst of an irrigated section known as the Kettle Falls valley, about three miles from the Great Northern railroad. Nearby are the falls of same name, often called the "Niagara of the West." Fruit, especially apples, is successfully grown. Town has a high school, and four churches, city owned water and electric lights.

Marcus: Altitude 1,260 feet. Population 1920, 551. Located on the east bank of the Columbia river, near its confluence with the Kettle river, and at the junction of the two branches of the Great Northern railway. The surrounding territory is rich with agricultural, mineral, timber and water power resources, whose development holds great possibilities. The Great Northern roundhouse and

shops are located here and two sawmills and a box factory are operated. Logging, tie making and the cutting of cedar poles are additional sources of income. City has a weekly newspaper, a four-year high school, three churches, piped water system, electric lights and volunteer fire department.

Northport: The "Smelter City." Altitude 1,333 feet. Population 1910, 476. Census of 1920, 906. Beautifully located, with a commanding view, on the Columbia river at the junction of two branches of Great Northern railway, 28 miles northeast of Marcus. Its main industry is the big modern smelter which employs about 300 men, with a monthly payroll of about $50,000. There are also seven sawmills adjacent to city and the virgin forests assure a continuous growth. Many cedar poles, ties, saw timber and wood are marketed. Dairying and diversified farming are important. City has a four-year high school, three churches, a bank, weekly paper, gravity water system, electric lights and fire department.

Springdale: Elevation 2,087 feet. Population, 1920 census, 184. Located on the Great Northern railway, 40 miles south of Colville and 47 miles north of Spokane. Logging is important and several sawmills are in vicinity. Many ties, much cordwood and hay is shipped. There is also much cut-over land, excellent for dairying and general farming. Town has a four-year high school, three churches, newspaper, bank, telephone system and electric lights.

Valley: Elevation 1,671 feet. A town of about 200 people, located on the Great Northern railway, 31 miles south of Colville. Gold, silver and copper mines are in vicinity. Some lumbering is carried on and many ties are shipped. Town has a bank, garage and a high school.

PEND OREILLE COUNTY.

This, the long narrow county situated in the northeastern corner, is the newest county in the state, being organized out of the eastern half of Stevens county in 1910. It is bounded on the north by British Columbia and on the east by the state of Idaho.

Natural Features: The Pend Oreille river enters near the southeastern corner from Idaho and flowing westward for about 10 miles turns abruptly north and continues to the British Columbia boundary line, where it empties into the Columbia river. It is navigable in the southern part of the course, but becomes rather turbulent as it works through the mountainous country above Ione, where it offers immense power possibilities. The largest bodies of farm lands lie in the valleys formed by this river and its principal tributary, the Calispel. The elevation of its floor is something over 2,000 feet. On either side the foothills not far away soon rise to the altitude of the low mountain ranges which extend north and south the full length of the county. Forests originally covered the entire surface and only a small portion is at present totally cleared. The trees are much smaller, however, than in Western Washington so that clearing is comparatively easy. Distributed throughout the county are a number of pretty lakes, including Sullivan, Bead, Calispel, Diamond and Sacheen, which are particularly attractive to campers and hunters.

Population: In 1910 the population was included in that credited to Stevens county. Probably 5,000, or about 20 per cent of the total, belonged to this part of the district. The 1920 census recorded 6,363, an increase for the decade of about 25%. Practically all dwell in the Pend Oreille valley and along its tributary creeks and about 20 per cent in Newport, the county seat.

Lands: The approximate land area amounts to 898,560 acres. Of this, 257,859 acres are held in the Kaniksu forest reserve; 40,313 acres are surveyed government lands open for filing; and 30,700 acres are state lands. Of the privately owned lands, 19,000 acres are improved, 210,000 acres are covered with timber and close to 300,000 acres are logged or burnt-over, or still covered with the original wild growth. Large additional areas can be placed under the plow when cleared, but the largest part will be best adapted to dairy-

ing and stock raising. Diversified farming can be carried on and irrigation is unnecessary.

Prices of Land: No cheaper land can be found in the state than in this county. Unimproved agricultural lands may be bought for from $10 to $25 an acre; grazing lands sell at from $1 to $5 an acre; improved areas near towns cost from $25 to $100; and more remote pieces can be bought for from $25 to $50 an acre. There are many acres for sale and settlers are welcomed.

Soil and Climate: Lands along the rivers, creeks, and lakes are composed of deep rich clay loam suitable for grain, timothy and clover. The uplands consist chiefly of a reddish sandy loam highly adaptable to vetches, clovers, winter grains, potatoes and fruits, especially strawberries. There is also some peat soil excellent for timothy and oats. The climate as a whole is very salubrious for man and propitious for crops. Rainfall since 1910 has averaged 24 inches at Newport and 24.94 inches at Cusick. Snow lies on the ground from three to four months. The late spring and early fall forests do practically no damage to crops.

Resources and Industries: Agricultural lands, immense bodies of timber, and various mining projects all play important parts in enhancing the county's wealth. It is the heaviest timbered county in eastern Washington, the estimate of standing timber approaching 10 billion board feet, chiefly white and western pine, fir, tamarack, and cedar—enough to last the present mills many years. Many cedar poles, posts, shingle bolts, piling, cordwood, etc., are manufactured. Mining is just beginning to develop. The cultivation of grains and grasses is one of the main agricultural industries, but grazing is important and much stock is raised. About 40,000 bushels of potatoes and 60,000 bushels of oats are produced yearly, besides much hay and some corn and other crops. Horticulture is represented by about 12,600 apple trees, 5,400 plum and prune trees and 2,000 pears, peaches and cherries.

Water Power: A vast potential water power runs to waste in the Pend Oreille river, particularly at Z canyon on Clark fork, near Metaline, where at low stages of water 120,000 continuous horsepower can be developed and by storage reservoirs 350,000 horsepower is possible. A few years ago the U. S. Departments of the Interior and Agriculture approved a power permit to the International Power & Manufacturing Company for the development of a power project at this point, which if carried out will result in one of the largest projects in the country for the development of cheap power. At present the falls in Sullivan creek are harnessed and power provided for the million-dollar cement plant at Metaline.

Transportation and Markets: Altogether, 99 miles of steam railway have been built in the county. The main line of the Great Northern crosses the southeastern corner and the Idaho & Washington Northern serves the Pend Oreille valley as far as Metaline near the northern boundary line. Good highways exist from north to south and to some points east and west. Spokane is the principal market for surplus products.

Social Conditions: The county is divided into 35 school districts and five high school districts, high schools being located at Newport, Dalkena, Ione, Locke and Cusick. Church facilities are provided at certain places. Mail is distributed by 16 postoffices and three rural routes. Newspapers are maintained at Newport and Ione. Commercial bodies and fraternal societies are supported in the larger centers. There are 217 miles of telephone and 29 miles of telegraph.

CITIES, TOWNS AND VILLAGES.

Cusick: A town of about 200 people, on the Idaho & Washington Northern railroad, at the junction of the Calispell and Pend Oreille rivers, 20 miles north of Newport. Two big lumber companies operate in town and much farming is carried on in surrounding territory. High school work is provided and one church is supported.

Dalkena: A town of about 400 people located on the Idaho & Washington railway, 12 miles northwest of Newport. Principal enterprise is the big sawmill of the Dalkena Lumber Company, which employs about 150 men. The logged-off land will be

suitable for dairying. High school work is taught.

Ione: Altitude 2,095 feet. Population, 1920 census, 541. Situated on the Pend Oreille river and the Idaho & Washington Northern railroad, 50 miles northwest of Newport. Lumber products to the value of $500,000 are produced yearly. Town has gravity water system, electric lights, paved sidewalks, public parks, good streets, one church building used by several denominations, a grade school, a three-year high school, bank and a weekly newspaper.

Metaline Falls: Altitude 2,061 feet. Population, 1920 census, 153. Situated near the northern extremity of the county at the terminus of the Idaho & Washington Northern railroad in the Pend Oreille valley. Its main industry is a large Portland cement plant, with a daily capacity of 2,000 barrels. Mining and a little farming are also carried on. Town has cement sidewalks, good streets, a church, a $20,000 school building, good water system, and electric lights.

Newport: County seat, and main shipping point and trade center for the county. Population 1920, 950. Prettily situated at the junction of the Idaho & Washington Northern railroad and main line of the Great Northern, overlooking the Pend Oreille river, flowing 60 feet below, 46 miles northeast of Spokane. Townsite is intersected by the Idaho boundary line. Lumbering, agriculture, fruit raising and mining are all important and will assure future growth. It has all branches of business, including one lumber mill, several woodworking plants, and a machine shop. There are four churches, a four-year high school, nine fraternal organizations, a weekly newspaper, a bank, and twelve miles of street.

Usk: A town of about 125 people, located on the Idaho & Washington Northern railway, 20 miles northwest from Newport, in the Pend Oreille valley. Sustaining industries are dairying and lumbering.

An Eastern Washington valley.

Big Bend and Palouse.

DOUGLAS COUNTY.

Douglas county comprises the inner townships of what is generally called the "Big Bend Country." It is situated in the central part of the state and is more than half encircled by the Columbia river, whose ancient course is said to have been the Grand coulee forming the eastern boundary.

Topography: With the exception of a narrow strip along the Columbia river and in Moses coulee, which like an old river bed cuts deep into its surface from the south, the county consists of a comparatively level or gently rolling plateau of from 2,000 to 2,800 feet in altitude, broken here and there by more shallow depressions or draws. From a vantage point on one of the higher crests, at harvest time, this plain appears like an unbounded field of waving golden grain. Within a short distance of the river this plateau is suddenly broken off and the irrigated benches are reached by rapid and sometimes precipitous slopes, or frequent terraces. Along the western border a negligible area is occupied by some low mountainous country, sparsely covered with small pine trees.

Climate and Soil: The soil in the central and western sections is a heavy silty loam, 20 feet or more deep and very productive. This gradually becomes lighter in texture toward the northern and eastern boundaries, but towards the south is mixed with some sand. Wheat is the main crop, except in the coulees and along the Columbia river, where fruit growing under irrigation is most profitable. Rainfall varies from 9 inches to 13 inches. The mean annual temperature is about 43 degrees. The last killing frost occurs between April 15th and May 1st, first autumn frost between the 1st and 15th of September. Snow lies on ground from December 1st to March 1st.

Population: The 1910 census recorded a population of 9,227, an increase of 87 per cent over the previous census. A moderate increase is taking place, the 1920 census reporting 9,392, or 5.7 to the square mile. Last school census showed 3,246 of school age. Scandinavians, Scotch, Irish, Danish and Germans are conspicuous among the foreign-born.

Lands: There are 1,143,680 acres of land in the county; 21,722 are unreserved and unappropriated federal lands, 91,126 are state lands, and the remainder, amounting to approximately 1,000,000 acres, has passed into private ownership. About half the county is improved and about 100,000 acres additional could be cultivated, while the remainder would be suitable for grazing purposes.

Prices of Land: There is considerable good land offered for sale. Wheat land may be had at prices ranging from $25 to $100, the higher prices being for lands in the southwestern part; the lighter lands in the northeast reach a maximum of about $50. Lands under irrigation range around $200 for hay and up to $1,000 for orchard. Agricultural lands in the rough may be bought for $20 to $40. Lands suitable for grazing only can be obtained for $5.

Transportation and Highways: The only railroad penetrating the interior of the county is a branch of the Great Northern running from Wenatchee to Mansfield, located near the center of the region. The Oroville-Wenatchee branch of the Great Northern, traversing the Columbia river valley, receives much of the tonnage of the western townships and the Washington Central at Coulee City receives much of the wheat of the east and northeast. The main line of the Great Northern skirts the southern edge. The Columbia river is navigable all round the county and regular boats ply between Brewster and Bridgeport on the north. The Sunset Highway follows the east bank of the Columbia river to Orondo and, turning eastward, passes through Waterville and continues to Coulee City and Spokane.

Resources and Industries: This is strictly an agricultural county. First in importance for the county as a whole is wheat raising, the annual

crop amounting to between two and three million bushels. Along the Columbia valley and in Moses coulee fruit raising is the principal industry. About 600 carloads were shipped in 1919. The county also produces about 400,000 bushels of oats, 100,000 bushels of barley, 60,000 bushels of corn, several hundred carloads of fruit and considerable alfalfa. Dairying, stock raising and diversified farming are becoming of greater importance. The 1919 assessor's census showed about 3,000 milch cows, 16,000 horses, 1,000 mules and numerous hogs, sheep and stock cattle in the county.

Much clay suitable for pottery is found in places and a little scraggly timber near the Columbia and on a few of the high knolls. A future asset is the unlimited water power available in the Columbia river.

Social Conditions: There are 98 school districts, and high schools are located at Waterville, Bridgeport, Mansfield and Withrow. Churches of all denominations and practically all fraternities are represented. There are 16 miles of telegraph and 1,186 miles of telephone. The use of automobiles is general and the farms as a whole indicate thrift and success in a high degree. A county fair is held at Waterville in September. There are 23 postoffices and five rural routes.

CITIES AND TOWNS.

Bridgeport: Altitude 817 feet. Population 1920, 337. The town is located in the Columbia river valley at the northern extremity of county. The fruit industry has taken quite a hold in this vicinity and many apples are shipped each year. Diversified farming, dairying and stock raising are also important. Town has a large flour mill, a sawmill, bank, cement block factory, and a weekly newspaper. A church, and four-year high school, and several fraternities are also maintained. Value of all taxable property in 1919 was $131,747. Transportation is by steamboat to Pateros and stage to Brewster and Mansfield. A ferry to Okanogan county is operated at this point.

Douglas: Elevation 2,374 feet. Population about 200. An important wheat shipping point, at junction of the Great Northern and Waterville railways and on the direct line of Sunset Highway. Town has a flour mill and several large warehouses, a blacksmith and machine shop, a church, good schools, and a city park. Stages operate to Farmer and Waterville.

Mansfield: Elevation 2,258 feet. Population, 1920 census, 478. An important wheat shipping point at terminus of Great Northern branch. Several large grain elevators and warehouses, two banks, garages, a four-year high school, four churches, weekly newspaper and two fraternal organizations are supported. Stages run to Bridgeport and Delrio.

Waterville: County seat. Altitude 2,617 feet. Population 1910, 950. Census of 1920, 1,198. It is located in southwest part of county, seven miles east of the Columbia river, in the heart of one of the richest districts of the Big Bend country. City has a $50,000 modern courthouse, two banks, a flour mill, brick yard, two newspapers, several large warehouses, and one of the six federal land offices of the state. There are maintained six churches, a four-year high school, public library of 1,600 volumes, two public parks, four fraternal organizations, and a volunteer fire department. All public works are modern. Transportation is by Great Northern trains reached by the Waterville railway, and by auto stage to Wenatchee over the Sunset Highway. Water is from springs on Badger mountain, five miles south.

Withrow: A wheat shipping and trading center of about 150 people, on the Great Northern branch railway, midway between Waterville and Mansfield. Church and high school facilities are offered. A weekly paper and a bank are maintained.

GRANT COUNTY.

Grant county lies within the territory known as the "Big Bend" and until 1909 was a part of Douglas county. Like much more of eastern Washington, in its wild state it is a sagebrush region.

Topography: The surface is usually undulating or rolling with a general slope towards the south. Nearly all the southern half is occupied by two slightly broken plains, which are separated from each other by

the low "Frenchman Hills" extending east and west and are terminated by low ridges known as Badger mountains on the north and Saddle mountains at the south. The general elevation of these plains is from 700 to 900 feet above the Columbia river, which cuts them on the west. Quincy plain, the northern one, takes in Moses lake on the east; and the other, known as Beverly plain, includes Crab Creek coulee winding along the east and south. Sand dunes are found here and there.

The northern half of the county rises to an elevation of 2,500 feet or more and is covered with wheat fields which blend with the rich wheat sections of Lincoln county toward the east, but are cut off abruptly on the west by the Grand coulee, whose western perpendicular wall marks the eastern boundary line of Douglas county. This coulee, one of the most wonderful geological features on the continent, contains much agricultural area and a number of alkali lakes. It is said to be the old bed of the Columbia river, which continued its course through what is now Moses lake and Crab Creek canyon.

Climate and Soil: Twenty-one types of soil have been classified in the county, ranging from silty fine sandy loams to types in which sand is the predominating substance with silt and clay in smaller percentages. All are generally free from alkali and, under irrigation which will sometime be applied to most of the county, yields remarkable crops of fruit and alfalfa. Wheat is at present the main product, but limited quantities of barley, oats and alfalfa are produced. The annual precipitation is 7.97 inches at Ephrata, about 17 inches on the wheat lands in the north, and about seven inches in the southern half. Average snowfall from south to north is 5 to 24 inches. Prevailing winds are from the west.

Population: No increase has taken place in this county of late years. In 1910 a population of 8,698 was recorded. The 1920 census enumerated 7,771. Natural-born Americans predominate in the ratio of two to one of all other nationalities. The largest town contains between 400 and 600 people.

Lands: The county comprises 1,740,800 acres, of which 38,993 acres are open for entry by application at the U. S. Land Office in Waterville, and 23,040 acres may be obtained through the Yakima U. S. Land Office. The state owns 78,121 acres and about 1,600,000 are in private ownership. Both dry farming and irrigation are practiced. The future holds many opportunities in this part of the state, for irrigation will sometime be practiced on a huge scale and will affect from 500,000 to 1,000,000 acres. The remainder will be good for wheat raising or grazing. At present about 500,000 acres are under cultivation, of which 4,000 acres are irrigated.

Prices of Land: Unimproved dry lands with remote chance for irrigation varies from $5 to $25 an acre. Broken scab land useful for grazing only can be bought for even less. Wheat lands range from $25 to $85. What little irrigated land there is sells for $200 or $250 per acre if in alfalfa and from there up to $500 or higher if in orchard, some of the best with full bearing trees reaching the $1,000 mark. There are also chances to lease on shares.

Resources and Industries: There is no timber in the county. Unlimited water power will some day be developed in the Columbia river, especially at Priest Rapids; at present practically all of it runs free. Scarcely any useful minerals are found excepting silica, sodium salts and a little potash. Some of the alkali lakes possess medicinal qualities, Soap lake being much advertised for that reason.

The county at present relies for its principal income on the wheat crop and a limited acreage is devoted to barley, oats, corn, alfalfa and orchards. Wheat makes up about 85 per cent of the total, the average yield being over 2,000,000 bushels annually. The orchards are increasing in importance, there being now about 200,000 apple trees and 12,000 pear trees, most of them being near Moses Lake, Coulee City, Quincy and along the Great Northern railway. This is also an important sheep county, about 75,000 being counted in the spring of 1919; the winters and springs are particularly favorable to them. Cattle are raised on the bottom lands and dairying and poultry raising are being promoted.

Transportation and Highways: The northern half of the county is served by the Great Northern and the

Washington Central branch of the Northern Pacific. The southern townships are served by the main line of the Chicago, Milwaukee & St. Paul, while the Connell-Northern branch of the Northern Pacific enters at the southeast corner and runs to Adrian. Total railroad trackage amounts to 247 miles. The two routes of the Sunset Highway also pass through the county, which with the various county roads link up every section with rapid transportation facilities. Stages operate between Quincy and Ellensburg; from Ephrata to Neppel and Soap Lake; between Coulee City and Mansfield, and from Marlin to Ruff.

Social Conditions: Churches, schools and postoffices are maintained wherever there are people to benefit from them. At present 28 postoffices with three rural routes are maintained. The county is divided into 98 school districts and nine high school districts. About 1,040 miles of telephone wire and 246 miles of telegraph wire connect the leading centers and reach to the various farms. In the summer time Soap Lake becomes a mecca for those desiring recreation amid cool breezes.

CITIES AND TOWNS.

Beverly: Elevation 546 feet. A town of about 100 population on the Chicago, Milwaukee & St. Paul railroad and the east bank of the Columbia river at "Sentinel Gap," in the southwest corner of county. Helper locomotives are maintained here. School facilities are available.

Coulee City: Altitude 1,584 feet. Population 1910, 276; census of 1920, 472. An important grain and stock shipping point in the heart of the Big Bend wheat belt, and located at the only point where the Grand coulee can be crossed. In addition to the wheat fields a number of splendid orchards are near and gardening has been developed quite extensively. Much irrigation is practiced in the big coulee extending for 25 miles north to the Columbia river.

Ephrata: County seat. Altitude 1,265 feet. Population 1910 census, 322; 1920 census, 628. Situated on the main line of the Great Northern railway, surrounded by wheat, orchard and alfalfa lands. Irrigation by pumping from lakes and wells is quite successful. The town serves as a shipping and trading point for a wide territory. It has several large warehouses, a new modern courthouse, bank, several garages, two churches, a four-year high school, weekly newspaper and several fraternities.

Hartline: Elevation 1,912 feet. Population 1920, 282. A wheat center, in Paradise valley, in the northeastern part of county. It has a large flouring mill of 600-barrel capacity, grain elevator, several warehouses, two garages, two blacksmith shops, bank, newspaper, four churches and a four-year high school. Business houses are of brick. Total value of taxable property is $250,000.

Krupp: Elevation 1,315 feet. Population 1920, about 150. A wheat shipping center in the extreme eastern part of county in Crab Creek canyon. This creek flows through town and is never dry. Areas nearest town are devoted principally to hay. To the north and south are expansive wheat fields. Horticulture and dairying are also practiced. There are several warehouses, a bank, a four-year high school and two churches.

Neppel: A town of about 100 people, near the southern end of Moses lake, 25 miles southeast of Ephrata. Irrigation from wells is successfully carried on and fruit, stock and truck farming are profitable. A high school and church are maintained. Transportation is by a branch of the C., M. & St. P. railway, and stages to Ephrata.

Quincy: Altitude 1,302 feet. Population 1910, 264; 1920 census, 285. Located on the Great Northern main line, six miles from the Columbia river and 16 miles west of Ephrata. Much wheat is shipped and stock, poultry, fruit and vegetables are raised. The city has a bank, three churches, several warehouses and garages, and a high school.

Ruff: Elevation 1,642 feet. A wheat shipping point of about 100 population, on the Chicago, Milwaukee & St. Paul railway at the eastern edge of county. It has three wheat warehouses, three churches, good school facilities and a bank.

Soap Lake: Altitude 1,189 feet. Population 1920, 352. A summer and health resort, on a lake of same name, 6½ miles northeast of Ephrata. The lake is of extreme

interest to scientists and tourists and its water is used by several sanitariums to cure skin diseases, rheumatism, stomach and kidney troubles, etc. There are also two salt plants and a factory for Soap lake products. Nearby are some successful orchards. The Great Northern railroad passes 2½ miles south. Two daily stages run to Ephrata.

Warden: Altitude 1,275 feet. Population 1920, 173. A wheat shipping point on the Chicago, Milwaukee & St. Paul railroad and the Connell-Northern branch, near the southeast corner of county. It is the principal shipping point for the southern end of the county. The town has three churches, a $15,000 schoolhouse, a $6,000 water system, and telegraph and telephone service.

Wilson Creek: Elevation 1,267 feet. Population 1910, 405. A freight division point on the Great Northern railway, at the confluence of the Wilson Creek and Crab Creek canyons, 23 miles northeast of Ephrata. The valley itself is very fertile but the main support comes from the limitless grain fields lying just beyond the perpendicular walls which seem to circumscribe the city. It has a bank, two churches, a four-year high school, weekly newspaper, electric lights and pure water. Total taxable weath is $220,000.

FRANKLIN COUNTY.

This county comprises the territory known as the triangle of the Snake and Columbia rivers, in the southeastern part of the state, and on account of its location is grouped with the Big Bend counties.

Topography: The main topographical divisions include the high rolling plateau country, or wheat lands, in the east and northeast of the county, with an elevation of from 800 to 1,800 feet; the desert plains toward the south and west, ranging in altitude from 900 to 1,200 feet; the Esquatzel and Washtucna coulees cutting from the south and east, respectively, and merging in the north central section; the canyons of the Snake and Palouse rivers at the eastern edge; and the gravelly and scab lands lying near the Columbia and Snake rivers and dropping to an elevation of 350 feet. These divisions are not always clearly marked, as in places they blend with each other. There are few waterways carrying water except immediately after sudden thaws. The change in elevation is usually gradual excepting near the coulees and river canyons. The most sudden change is at White Bluffs, in the northwest corner, where a drop of 500 feet or more occurs within a distance of one-fourth to a half mile.

Soil and Climate: There are as many as 26 soil types and four classes of miscellaneous material in the county. The most important is the Ritzville, silty loam, containing about 50 per cent sand, 37 per cent very fine sand, and 4 per cent clay. This type covers the eastern half of the county and comprises the greater part of the wheat lands. Most of the other types possess varying but lesser quantities of silt and correspondingly larger portions of fine or very fine sand. Much of this will produce rye, wheat and other grains, but most of it needs irrigation for successful farming. That already irrigated yields excellent crops of alfalfa, fruits, grapes and vegetables. In some places four crops of alfalfa are cut in a season. Rainfall is very light, averaging about nine inches in the northern part and six inches in the south. Growing season ranges from 120 to 170 days, longest season being near Pasco. Winters are mild and short. Mean annual temperature is between 50 and 55 degrees.

Lands: The total area amounts to 771,840 acres, of which 35,896 acres are unappropriated and unreserved government lands, described as "grazing and desert," and 39,128 acres are state lands, leaving in private ownership nearly 700,000 acres. Less than half of this is under cultivation but something over 400,000 acres are fenced. The unimproved lands are principally desert areas covered with sagebrush. About 3,000 acres are under irrigation and about 10,000 acres more are now being developed. An additional 50,000 acres will be irrigated by the completion of the five-mile dam in the Snake river, for which an initial appropriation was made by the last regular session of the legislature.

All but 10 per cent of the county can be finally irrigated, should the Columbia basin project now being investigated be found feasible. Much of the unimproved land is good for pasture.

Prices of Land: Lands suitable for grazing only are worth from $2 to $8 per acre. The cheapest wheat lands sell for as low as $15 and the best as high as $50. Hay lands under irrigation sell for from $200 to $300 and bearing orchards from $300 to $500 per acre. One should have at least 160 acres of wheat land, but the usual small area will do under irrigation. Wheat lands may also be leased for one-fifth or one-fourth of crop in warehouses.

Resources and Industries: There is no timber in this county and scarcely any minerals have been found excepting silica. Vast water power can be generated in the Columbia, Snake and Palouse rivers. The estimated minimum at Five Mile Rapids, located four miles northeast of Pasco, is 44,000 horsepower, and the maximum 250,000 horsepower. This power will probably be sometime used to pump water for irrigation purposes.

The principal crop for the county is wheat, which in relative importance is 67 per cent of the whole and amounts to about half a million bushels annually. Livestock amounts to 14 per cent, hay 8 per cent, fruit 6 per cent, and all others 5 per cent. It is one of the leading counties in sheep raising, about 50,000 being enumerated in the spring of 1919. Many hogs and some cattle and horses are also raised. Fruit and hay are confined principally to the limited irrigated sections. The county has about 27,000 apple trees, and 15,000 pear, peach and cherry trees, in addition to grapes and other miscellaneous fruit. When the entire county is irrigated the returns will be enormous.

Transportation, Highways and Markets: The county is provided with 240 miles of steam railroad trackage. The Northern Pacific main line serve the most inhabited parts and connects at Connell with its own branch leading toward the northwest, and the Oregon-Washington Railroad and Navigation Company serves the northeastern tier of townships. The Central Washington Highway is open from Pasco to Spokane and is frequented in the summer by a continuous stream of cars. Water transportation is supplied by the Snake and Columbia rivers to Lewiston, Idaho, and Portland, Oregon. Regular wharves are maintained at Pasco. All products find a ready market, prices being governed by Spokane, Tacoma and Seattle markets.

Population: According to the U. S. census report, only 486 people were dwelling in this county in the year 1900. During the succeeding 10 years, however, while the desert lands were being filed on, in accordance with the enlarged homestead act, a 960.3 per cent increase took place and brought the total up to 5,153. A more moderate growth has occurred since, bringing the total according to the 1920 census up to 5,877, living principally in Pasco and Connell and along the Snake and Columbia rivers.

Educational, Social, Etc.: There are 34 school districts and four high schools, located at Pasco, Connell, Kahlotus, and Eltopia. Communication by wire is ample, there being 664.8 miles of telephone and 332 miles of telegraph wire. There are also eight postoffices and four rural delivery routes. By these agencies and the prevalence of automobiles many of the advantages of a more settled region are enjoyed.

CITIES, TOWNS AND VILLAGES.

Connell: Altitude 838 feet. Population, 1920 census, 311. A railroad center in the north central section of county on the main line of the Northern Pacific railway, where the Connell Northern branch of the Northern Pacific and the Oregon-Washington railway meet. It is the central distributing point for the northern portion of county. The town has two banks, three garages and three grain warehouses; also a $15,000 brick high school, weekly paper, three churches, and five fraternities. Business buildings are brick or concrete and a volunteer fire department is maintained. The Washington Central Highway also connects the town with Pasco and Spokane. A free auto camping ground is provided.

Eltopia: Elevation 591 feet. A village of about 100 people on the Northern Pacific railway and Wash-

ington Central Highway, 18 miles north of Pasco. It is principally a wheat shipping point. It has two grain warehouses, a bank, garage, and high school.

Kahlotus: Elevation 891 feet. Population 1920, 151. A wheat shipping point located in the Washtucna coulee in the northeastern part of county, and on the lines of the Oregon-Washington and Spokane, Portland & Seattle railways. Town has three grain elevators, garage, bank, a four-year high school and church.

Pasco: County seat. Altitude 378 feet. Population 1910, 2,083. Census of 1920, 3,362. Located in the Columbia river basin near the mouth of the Snake river. Each of these rivers is navigable, the Columbia affording steamer transportation to the Pacific ocean. Pasco is an important division point for the Northern Pacific and Spokane, Portland & Seattle railways, which maintain extensive railway yards here and a 37-stall roundhouse with a large annual payroll. Altogether, 15 passenger trains stop each day and the Oregon-Washington line can be reached by ferry at Kennewick. Such unusual transportation facilities must finally prove important factors in the city's growth. Additional industries include a sheet metal works, machine shop, cigar factory and a bottling and soda works. A stockyard has been recently opened up a few miles away. The business section of city is substantially built. It has three miles of paved street, cement walks, a paid fire department and electric lights. There are two banks, nine churches, two grade schools, an $85,000 high school, a $100,000 courthouse, an $18,000 Carnegie library, a $40,000 city hall, two public parks, and seven fraternities.

ADAMS COUNTY.

Adams county, lying in the southeastern section of the state, is also a part of the "Big Bend" wheat region and derives most of its income from wheat farming.

Topography: Its topography is generally of a gently rolling nature, like other portions of the big wheat belt, but is broken occasionally by coulees or draws which expose considerable rock in places and at the same time form a limited area of low land which may be irrigated from springs or lakes. General altitude is from 2,000 feet at the northern limit to about 1,000 feet at the Franklin boundary line. On the higher crests one can see wheat fields reaching almost to the horizon in every direction. Land in its natural state was covered with sagebrush.

Population: The census of 1910 records a population of 10,920, representing an increase over the previous census of 150 per cent. The 1920 census recorded 9,623 in the county. School census for May 1, 1919, enumerates 3,204 of school age. A Russian settlement, located west of Ritzville, the largest city, has proved successful.

Soil and Climate: The soil in all parts is a volcanic ash or basaltic loam ranging in depth from one to sixty feet. It varies in texture, the heavier sections being toward the north and east. The longer it is properly cultivated the better it seems to produce. Wheat yields range from 15 to 45 bushels per acre. The climate is mild; mean maximum temperature at Lind near center of county varies from 39 degrees in January to 91.5 degrees in July, and the mean minimum from 23.2 degrees to 55.9 degrees. Summer heat is without humidity. Yearly precipitation averages about 12 inches at Ritzville and 11 inches at Lind.

Lands: The total area is 1,223,680 acres, of which 9,202 acres are unreserved and unappropriated public lands and 56,558 acres are state lands, which leaves a balance held in private ownership of 1,100,000 acres. About 80 per cent of the county is tillable and the remainder suitable for pasture. At present over 800,000 acres are in cultivation. Here and there are pieces of so-called "tule" lands and other low flat meadows.

Prices of Land: Unimproved lands useful chiefly for grazing may be purchased at from $5 to $15 an acre. Improved lands sell for from $20 to $75 per acre, except that near Ritzville the price will reach $100 for best lands. Opportunities to lease

for a term of years on the basis of one-third of crop to owner may be found. Much land is farmed in this way.

Resources and Industries: This county must always depend on its rich agriculture land for future growth. The present productiveness, however, will be increased many fold if the proposed Columbia Basin irrigation project is carried out and intensified farming is practiced. About 90 per cent of the annual crop value is from wheat, of which from four to five million bushels are produced, thus ranking it among the five leading wheat producing counties in the state. About 250,000 bushels of oats and about 40,000 bushels of barley are yielded. A limited amount of stock is raised and dairying and hogs are being encouraged. In 1919 there were about 2,500 milch cows, 4,000 hogs, 4,000 stock cattle, 20,000 sheep and 9,000 work horses. Creameries are located at Othello and Ritzville. There are also about 13,000 apple trees and a few peach and pear trees. A little irrigation is carried on along the Palouse river. Wells are usually resorted to for domestic purposes.

Transportation and Highways: This county is unusually well provided with railroads, which extend like a net in all directions and serve practically every postoffice with either main line or branch. The Chicago, Milwaukee & St. Paul has 126 miles; the Northern Pacific, 99 miles; the Oregon-Washington Railway & Navigation Company, 58.8 miles; and the Spokane, Portland & Seattle, 53.5 miles. The principal highway is the "Central Washington," the main road from the Yakima valley to Spokane, which crosses from the southwest to the northeast. County roads connect with this and bring the total up to about 2,000 miles.

Social Conditions: On account of the large farms and thinly populated regions social advantages in the country districts are inferior to the cities and irrigated sections. Such disadvantages are partially overcome, however, by the excellent train service, the prevalence of automobiles and the number of telephones maintained, which place all within easy communication with the centers. A majority of the farmers have automobiles and the homes indicate thrift and prosperity. There are 19 postoffices, 105 school districts and seven high schools. The Adams county fair is held each September at Ritzville, county seat.

CITIES, TOWNS AND VILLAGES.

Cunningham: Altitude 1,174 feet. A wheat shipping center of about 100 people, located in the southwestern part of the county, on the Northern Pacific railway.

Hatton: An important wheat shipping town of about 100 population, located on the Northern Pacific railway in the south central part of the county, 45 miles southwest of Ritzville. It has a grain elevator, and several warehouses. One church, a bank and a high school are maintained.

Lind: Altitude 1,363 feet. Population 1920, 724, including many Russians and Germans. It is located near the geographical center of county, at the crossing of the Northern Pacific and Chicago, Milwaukee & St. Paul railways. About 400,000 bushels of wheat are shipped annually. It has a bank, flour mill, newspaper, four-year high school, three churches, electric lights, good water supply and volunteer fire department.

Othello: Altitude 1,050 feet. Population, 1920 census, 649. Located in the "Pan Handle," on the Chicago, Milweukee & St. Paul railroad, which maintains its shops and roundhouse here. Surrounding country is devoted to wheat raising. It has two churches, a four-year high school, good water system, town park and volunteer fire department.

Ritzville: County seat. Altitude 1,814 feet. Population 1910, 1,859, including many Germans and Russians. Census of 1920, 1,900. The city is located on the main line of the Northern Pacific railway, 63 miles southwest of Spokane, in the midst of a slightly undulating section of beautiful prairie country, rich and fertile and particularly adapted to wheat and potatoes, but suitable also for other cereals. Good fruit is raised and diversified farming would be successful. It was originally the greatest primary wheat shipping center in the world and is still a very important shipping point. Within the city a large flouring mill of 450-barrel daily capacity, employ-

ing 25 men, runs day and night. There are also a creamery and ice manufacturing plant and four warehouses. City has three banks, with about $2,000,000 deposits, six garages, two moving picture show houses, a four-year high school, two grade school buildings, 10 churches, a Carnegie library of 5,000 volumes, public park, weekly newspaper, municipal water system, electric lights, paved business streets and volunteer fire department. A county fair is held each fall.

Washtucna: Elevation 995 feet. Population 1920, 359. An important wheat shipping center located on the Oregon-Washington and Spokane, Portland & Seattle railways, in the Washtucna coulee, near the southeast corner of the county. Many sheep and other livestock are raised in the vicinity. A little land is irrigated and some fruit is produced. The town has a bank, weekly paper, two garages, a high school, two churches, three fraternities and a library; also volunteer fire department and electric lights.

LINCOLN COUNTY.

This county comprises the northeastern part of the "Big Bend" and is one of the most important in the state for the production of wheat and livestock.

Topography: The topography is usually of a slightly rolling nature with a general slope toward the south and southwest. The highest altitude, about 2,500 feet, is reached on the ridge followed by the Washington Central railroad, where also the most productive wheat lands extend. The Columbia and Spokane rivers fringed with a little pine timber skirt the northern boundary and receive what little drainage seeps toward the north. The southern half is drained into Crab creek, which flowing from east to west, dissects the southern townships. The surface is broken here and there by shallow coulees and other depressions which reveal the jagged rock and permit the growth of a scattering of small pines useful for firewood.

Soil and Climate: The soil is very fertile. It is of volcanic origin, composed principally of decomposed basalt and known as a basaltic loam or volcanic ash. Under the microscope each atom resolves itself into a perfect kernel of soil, covered by a moisture-preserving shell, strong and enduring. It is very rich in lime and potash and well supplied with phosphoric acid and nitrogen. The depth varies, but is generally greatest on the rolling sections. The heaviest soil is in the northern half, which is one of the best wheat sections of the state. The soil in the southern portion has more of a sandy texture. Average wheat yields throughout the county are from 10 to 40 bushels per acre. As the county is large and well exposed it experiences generally a wide range of temperature and some differences in precipitation. Rainfall is from 9 to 12 inches and snow from 20 to 35 inches. Growing season at Crescent in the northeastern corner, the only place where permanent records regarding frosts have been kept, is about 121 days.

Population: As in other sections devoted almost entirely to wheat farming, the population in this county is quite scattered, especially outside the towns and cities. In 1910 the recorded population was 17,539, or 7.6 to the square mile, representing an increase of 45.5 per cent over the 1900 figure. No increase has taken place since, the 1920 census recording only 15,141. Near Odessa is a settlement made up of many Russians. There are also many Germans, Swedes and Canadians in the county.

Lands: The total area comprises 1,473,280 acres, of which 12,657 acres are unappropriated and unreserved government lands and 50,217 acres are state lands. Lands in private ownership amount to 1,350,000 acres, of which nearly 800,000 are improved, but practically all is fenced. The unimproved is used chiefly for grazing purposes, but much of it can also be placed under cultivation. Over 300,000 acres of this county fall within the proposed Columbia basin irrigation project now being surveyed by the state.

Prices of Land: The non-tillable land, suitable for pasture only may be purchased for about $10 an acre.

Wheat lands are worth between $50 and $100 per acre and orchards, of which a limited area exists near the Columbia and Spokane rivers and along some of the coulees, are worth from $200 to $500 per acre. Frequent opportunities exist to lease or rent for one-third of crop.

Resources and Industries: Wheat raising is the principal industry of the county. The annual average yield is between 6,000,000 and 8,000,000 bushels, principally Bluestem and early Baart, which in quality is claimed to excel any other produced in the Pacific states. To handle this vast crop many large warehouses are located in the cities and at the various smaller railroad stations distributed throughout the county. There are also several flour and grist mills in the larger centers. Oats, barley and corn are raised in limited quantities and used locally for feed. Near the Columbia and Spokane rivers and in the Crab creek coulee some excellent fruit and a little alfalfa is raised. About 85,000 apple trees, 34,000 peach trees, 18,000 pear trees and 9,500 plums, prunes and cherries are in the county.

It is one of the leading stock raising counties in the state, but it excels principally in mules and horses, in which respect only one other county in Washington surpasses it. The 1919 report of the county assessor shows 21,000 horses, 1,900 mules, more than 4,000 milch cows, over 8,000 stock cattle and 3,600 hogs.

In the vicinity of the Columbia and Spokane rivers is a sprinkling of pine saw timber. The county also has a few undeveloped gold, silver and lead mining projects, a little marble and much clay.

Water Power: Two of the biggest developed water power projects in the state are on the Spokane river at the edge of the county. The oldest is at Little Falls where 36,000 horsepower has been developed and the other at Long Lake, a few miles above, where 90,000 horsepower has been developed. From these sites electric lights and power is supplied the entire Big Bend country, and much adjoining territory. About 15,000 horsepower is utilized by the Chicago, Milwaukee & St. Paul railway to electrify its road to the coast. Other possible power sites are at Goddard Rapids and the narrows near Fort Spokane.

Transportation and Highways: At present there are 205 miles of steam railroad in the county. The Great Northern main line and the Washington Central branch of the Northern Pacific cross from east to west; and the Chicago, Milwaukee & St. Paul, the Oregon-Washington, and the main line of the Northern Pacific cross the southeast corner. A number of branch lines to extend north and south are projected. The Sunset Highway, connecting Seattle and Tacoma with Spokane, runs directly through the county from west to east, touching at Almira, Wilbur, Davenport and Reardan. Regular stages are operated between these cities and Spokane, and side routes are maintained to the chief points off the main course.

Educational and Social: On account of the good roads and the common use of automobiles, these wheat regions, scattered as the population is, do not want for educational and social advantages. Nearly all the ranchers have automobiles and can reach their own schoolhouses or district centers and also the largest cities of the region in a comparatively short time. The county has 135 school districts, 12 high school districts, one private school and nine newspapers. There are 26 post-offices and 21 rural routes, serving every point daily. Telephone communication is maintained by 2,955 miles of wire. Churches of leading denominations are supported in the cities.

CITIES AND TOWNS.

Almira: Altitude 1,917 feet. Population 1910, 368. Census of 1920, 450. Situated in the west end of county, 45 miles from Davenport, on the Northern Pacific railway and Sunset Highway. It is a wealthy community, made so by successful wheat farming and stock raising, and is the principal shipping point for wheat raised in surrounding country, including much of northern Grant county. It has several warehouses, two banks, a weekly newspaper, a four-year high school, two churches, artesian wells and electric lights.

Creston: Altitude 2,462 feet. Population 1920, 317. Located on the

For the pleasure of auto parties many cities of Washington maintain free camping sites with all conveniences.

crest of the ridge midway between Almira and Davenport, on the Washington Central railway, in the center of a rich wheat district sometimes called "Brent's Country." Orchard valley or the "Peach Country" along Hawk creek to the north also contributes to its business activity. It has several warehouses, a bank, flour mill, newspaper, a four-year high school and five churches.

Davenport: County seat. Altitude 2,409 feet. Population 1910, 1,229. Census of 1920, 1,112. Pleasantly situated in the northeast section of the county on the Washington Central railroad and the Sunset Highway, about 47 miles west of Spokane. One of the richest wheat regions in the state is tributary, also a little orchard land. It has several large warehouses and wheat shipments run high. A large flour mill is also in operation. The city has two banks, eight churches, a $40,000 high school, weekly newspaper, a sanitarium, an $80,000 courthouse and several garages. Paved business streets, cement walks, good water supply, a paid fire department, and a tourist park with modern conveniences are supported. Stages run to Spokane and to all important points in the county.

Edwall: Elevation 2,314 feet. A town of about 250 people on the Great Northern railway, 34 miles west of Spokane. It has a flour mill, bank, large warehouse, garage, four-year high school and three churches.

Harrington: Altitude 2,167 feet. Population 1910, 661. Census of 1920, 882. Situated on the Great Northern railway, 51 miles west of Spokane and 17 miles from Davenport, in the center of a rich wheat region. It has several large grain warehouses, two banks, a 400-barrel flouring mill, a harvester factory, weekly newspaper, a four-year high school, five churches, public library, a 20-acre park, electric lights and municipal water system. Actual taxable wealth amounts to $1,000,000. Stages run to Davenport.

Lincoln: A town of about 250 people, located in the midst of a fruit and grain region, at the confluence of the Columbia and Spokane rivers. Timber, mineral and water power is tributary. A flour mill, sawmill, weekly newspaper and school facilities are supported. Stages run to Davenport and Hunters.

Odessa: Altitude 1,539 feet. Population 1910, 885. Census of 1920, 1,050. Located on main line of the Great Northern railway, 75 miles west of Spokane, in the southwest section of county, a great wheat farming district. Corn, fruit, vegetables, hogs and sheep are also successfully raised. It is an important primary wheat shipping point, and has a flouring mill of 400-barrel daily capacity. Other institutions include a creamery, two banks, six churches, four-year high school, newspaper, good water system, and volunteer fire department. Business structures are mainly brick.

Reardan: Altitude 2,498 feet. Population 1920, 420. Located on the Washington Central railroad, 25 miles west of Spokane, in the midst of a wealthy wheat section. Auto stages supplement train service. It has two banks, a 400-barrel flour mill, weekly newspaper, five churches, a four-year high school, electric lights and good water supply. An annual mule show is held about the middle of June.

Sprague: Altitude 1,899 feet. Population 1920, 822. Located near the southeast corner of county on the main line of the Northern Pacific railway, 41 miles southwest of Spokane. Surrounding country is rolling prairie, where wheat is the main product, but other cereals, livestock, fruits, and garden truck can be successfully raised and dairying is becoming of greater importance. About 700,000 bushels of wheat are shipped through its seven warehouses. It has a large flour mill, two banks, newspaper, four-year high school, four churches, a hospital, private academy, substantial business blocks, electric lights, municipal water, paved streets and cement walks.

Wilbur: Altitude 2,166 feet. Population, 1920, 870. Located on the Washington Central railway, 35 miles west of Davenport, near the northwest corner of county. It is an important shipping point and trading center for an extensive rich wheat region. It has a number of large warehouses, a large flour mill, a bank, weekly newspaper, public li-

brary, several garages, a four-year high school, electric lights, municipal water system, volunteer fire department and two parks, one containing 160 acres. Stages run to Spokane, Nespelem and Keller.

SPOKANE COUNTY.

Spokane is the second county in the state in taxable wealth, the third in population and the leading county of a large territory known as the Inland Empire, which includes eastern Washington, northern Idaho, northeastern Oregon, southeastern British Columbia and northwestern Montana. It lies close against the state of Idaho and about midway between British Columbia on the north and Oregon on the south. In addition to the usual form of county government it is one of the two counties in the state possessing township organization.

Topography: With the exception of a limited area of comparatively low mountains in the northeastern section and extended along the eastern boundary, the surface of the county is generally of a rolling or rolling to hilly character, yet with numerous level prairie uplands and valley bottoms. The southern townships are a continuation of the Palouse country and are drained by the northern tributaries of the Palouse river. The rest of the county is drained into the Spokane river, one of the most important tributaries of the Columbia. To the east of Spokane a wide fertile valley extending into Idaho and devoted to horticulture and farming has been created by this stream, which, after flowing through the city and hurling itself in immense torrents over Spokane Falls, cuts a deeper and narrower gorge and finally becomes the northern boundary line of the county. The highest elevation is reached in the northeast corner of the county by Mt. Spokane, 6,080 feet, one of Spokane's greatest tourist attractions, and by Mica peak, over 5,000 feet, southeast of Spokane. The elevation of the rest of the county varies from about 1,800 to 2,500 feet.

A light growth of pine timber is found in most parts of the county which becomes thicker toward the extreme north, where a considerable stand of commercial value still remains. Distributed generously throughout the county are numerous lakes, reflecting like mirrors the picturesque surroundings of woodland and hill, entrancing alike to stranger or native.

Soil: The soil varies according to locality. The southeastern section comprises a rich heavy silty loam, typical of the Palouse. Here wheat, seed peas and fruit are profitable. Farther north and west it becomes a trifle lighter and in some sections a little gravelly and sandy, but wheat is still a leading crop with dairying, livestock and fruit important contributors. The Spokane valley comprises a black gravelly loam well adapted to fruit raising and alfalfa under irrigation. There are also occasional peat beds in the county which make splendid meadows, while the rich upland prairies produce luxuriant crops of grain, vegetables and fruits.

Climate: A very equable climate is enjoyed in this section, due largely to the fact that the prevailing winds blowing from the southwest are warmed by the Japan stream in the Pacific ocean. The normal annual precipitation at Spokane city is 18.8 inches and the growing season is about 183 days. Sudden, violent changes of temperature seldom occur. The thermometer seldom rises above 97 degrees in summer and drops down to zero about four times in the coldest years; of 30 successive winters, nine were without zero weather at all. The monthly mean temperature reported by the U. S. Weather Bureau at Spokane for each month of the year is as follows:

	Deg.		Deg.
January	27	July	69
February	30	August	68
March	39	September	59
April	48	October	47
May	56	November	37
June	63	December	31

Population: The 1910 census credited this county with a population of 139,404, or 79.4 to the square mile, an increase of 192 per cent in 10 years. Some growth has been taking place during the past decade, the 1920 census recording 141,289. About 80 per cent of the people are

in the city of Spokane. Practically all nationalities are represented among the foreign-born, which are led by English and Canadians, Germans, Irish, Italians and Scandinavians.

Lands: The total land area amounts to 1,123,800 acres. There is practically no land which has not been reserved or appropriated, but 25,839 acres are held by the state subject to purchase. Practically all the remainder, except highways and inconsequential areas secured for city and county and government purposes, has passed into private ownership. Altogether, 997,516 acres aside from town and city lots are subject to taxation. Of this, 376,000 are improved, 66,000 acres are in timber and 555,000 acres are made up of unimproved cut-over or prairie lands. Most of the county is subject to future cultivation and all will be valuable for pasturage. About 30,000 acres are under irrigation and 10,000 additional can be readily irrigated from present projects.

Prices of Lands: Palouse lands in the southern part of the county and southwest of Spokane bring from $85 to $175 an acre, including the usual farm improvements. Unimproved lands in these same sections will fetch from $25 to $50, with the cost of putting under cultivation estimated at from $5 to $15. Towards the northern limits of the county and wherever a light growth of timber has stood, cut-over land may be bought for as low as $25 an acre, but it costs more of course to prepare for the plow. The same land improved will run to $125 per acre. Irrigated lands which are found principally in the Spokane valley and around Deer Park cost from $150 to $600, although special pieces of income property will run to $1,000 per acre. Lands suitable for grazing only can be obtained for from $10 to $13 an acre. Opportunities are frequent to rent or lease on shares.

Resources and Industries: The present wealth of this county has been derived from agriculture, mining, lumber and other manufactures, commerce and the distribution of hydraulic power. The actual valuation of the entire county is $247,676,962.

Agricultural Pursuits: Agricultural wealth is increasing from year to year. More diversification is taking place and more intensive methods are being employed. Among the leading agricultural pursuits are wheat farming, seed growing, horticulture, dairying and stock raising. Dairying development is chiefly in the improvement of herds with purer and better stock. A number of the largest and most modern dairies in the state and several world's champion cows are owned by dairymen in this section. Over 10,000 cows are milked and six creameries are supported. About 2,000,000 pounds of butter are made each year and about $1,000,000 worth of whole milk and cream are sold annually, which places the county second in the state in that respect. The county also has about 8,000 stock cattle, 7,000 hogs, 16,000 horses, many sheep and much poultry.

Apples are raised around Deer Park, in the Spokane valley and along the streams to the south and southwest of Spokane. At the present time the county has about 900,000 apple trees and about 25,000 pear, peach, plum, prune and cherry trees. Many carloads of apples are shipped yearly besides considerable other fruit. The entire output for 1919 amounted to 1,163 cars.

The wheat and other grain lands lying principally to the south and southwest of Spokane yield altogether over 2,000,000 bushels annually. Seed peas have been found especially adaptable in the southeast and are increasing in importance from year to year. The pea straw produced is also an impetus to stock raising.

Mining: Mining opportunities are meager in the county itself but the valuable properties of the Coeur d'Alene and British Columbia are tributary and a large percentage of the millions taken from those mines are banked and spent in the city of Spokane. Among the minerals found in the county are large deposits of clay, much granite, considerable silica, a little marble and some copper, gold, iron, lead, silver, tungsten, zinc and tin.

Manufacturing and Water Power: The presence of immense water power in the vicinity, together with the unlimited raw materials of various kinds, has made the development of manufacturing comparatively easy, but greater things may be expected

in the future. No part of the world, perhaps, has larger potential power. The Spokane river descends 1,280 feet in a distance of 100 miles, making possible a development of 400,000 horsepower. Already four plants have harnessed 172,000 horsepower, which supply power and light to many cities and districts in the Inland Empire. One of the biggest and most picturesque falls is close to the business center of Spokane city.

Among the leading manufactures are lumber, wood products and miscellaneous wooden utensils, paper, cement, clay products, canned goods, packed meats and other food supplies, besides drygoods, clothing, foundry supplies, and numerous other commodities.

Commerce: Commercial and financial importance is demonstrated by the presence in Spokane of the northwestern federal farm loan bank and a branch of the federal reserve bank of San Francisco; also by the vast jobbing business carried on. The deposits of its 25 banks amount to about $50,000,000.

Transportation and Highways: About every community in the county has immediate connection with transcontinental railroads. In total railroad mileage this county ranks second in the state. It is served by 548 miles of steam railway and 276 miles of electric. The leading steam railroads are the Northern Pacific, the Great Northern, the Chicago, Milwaukee & St. Paul, the Spokane, Portland and Seattle, and the Oregon-Washington Railroad & Navigation Company. A branch of the Canadian Pacific reaches Spokane from the north and a number of foreign lines use these main lines.

Electric lines extend from Spokane to Cheney and Medical Lake in Spokane county, down to the Palouse cities of Whitman county and to Coeur d'Alene, Idaho.

The highways radiate in all directions from Spokane, which is also headquarters for the National Parks Transcontinental Highway, extending from the Great Lakes to Puget Sound. A total of 2,700 miles of state and county roads, including 200 miles of macadam and concrete, are maintained. The state highways are known as the Inland Empire, the Central Washington, the North Central Washington, the Sunset and the Spokane-Newport. Stages too are common and connect the leading towns for miles around with the city of Spokane.

Social and Educational: Development and progress in social and educational affairs is equal to any other section of the West. Seventeen newspapers are published in Spokane and five in the remaining territory. Commercial organizations exist in the larger centers, about 20 women's clubs are in good standing, and churches and fraternities are practically as numerous as schoolhouses, which are well distributed throughout the region. Libraries, parks, hotels and camping grounds and theaters are common and conveniently located. The county ranks second in the state in number of school districts (159), in the number of high school districts (37), and in the number of private schools (30). All buildings and institutions are modern and progressive and thoroughly representative of the West. Mail is distributed from 46 postoffices, including 10 incorporated cities, and 10 rural routes are maintained; telephone and telegraph communication is facilitated by 76,916 miles of telephone wire and 1,036 miles of telegraph wire. The number of motor vehicles is probably about 15,000.

CITIES AND TOWNS.

Cheney: Altitude 2,336 feet. Population 1920, 1,252. Located at the terminus of the Washington Central railway and on the main line of the Northern Pacific, Spokane, Portland & Seattle, and Oregon-Washington railroads, 16 miles southwest of Spokane, with which city it is also connected by an electric interurban, and a paved highway constituting a link in the state highway between Pasco and Spokane. This city is primarily an educational center, one of the four state normal schools being located here, which now represents an investment of about $1,000,000 in buildings, grounds and equipment. One of the largest and most modern rolling mills with a daily capacity of 1,000 barrels has recently been built at a cost of about $250,000, and the city itself has just spent over $100,000 in street work and water extensions. The surrounding farming country is rapidly developing in fruit culture, dairying and wheat production. The city also has a large brick

yard, a rotary rod and weeder factory, two banks, a four-year high school, five churches, a weekly newspaper, electric lights, paved streets, good water system, volunteer fire department and a free camping park for tourists. Freight and passenger stages to Spokane supplement the train service.

Deer Park: Elevation 2,118 feet. Population 1910, 875; 1920 census, 1,103. Located on the Great Northern railway, 27 miles north of Spokane, with which city is is also connected by a paved highway. Surrounding country is undulating, with much timber still remaining but being rapidly cut off. The famous Arcadia orchard tracts comprising about 8,000 acres of apple trees just coming into bearing are located close by. In the vicinity all farming enterprises suitable for the Spokane country do well. The Deer Park Lumber Company employs about 200 men and the Deer Park Artificial Stone Company about 50 men. Manufactures for 1918 amounted to about $750,000. Principal business lines include also five general stores, drug store, hardware store, two meat markets, furniture store, flour mill, grain elevator, two blacksmith shops, bank, two garages, weekly paper and picture show. Two schoolhouses, including a four-year high school, five churches and eight fraternal organizations are maintained.

Fairfield: Altitude 2,559 feet. Population 1920, 413. An agricultural center, located on the Oregon-Washington railway, 33 miles southeast of Spokane, in a rich section of the Palouse country. In addition to wheat fields, about 1,000 acres of apples and much alfalfa have been proving the success of horticulture and dairying in the vicinity. This section is also most successful in the raising of seed peas. Several large warehouses have been recently built to handle the output and many women are employed sorting. About 150,000 bushels of peas and 200,000 bushels of wheat are marketed. The city also has a creamery, bank, high school, three churches, newspaper, a public park, electric lights and good water.

Four Lakes: A town of about 200 people, located on the electric railroad and Washington Central Highway, 12 miles southwest of Spokane. Surrounding lands are cut into five and ten-acre tracts excellent for fruit culture. Wheat raising and dairying are also important. High school advantages and church facilities are provided.

Hillyard: Population 1910, 3,276. Census of 1920, 3,942. Area within corporate limits 1½ square miles. Total assessed valuation $2,355,000. This city, although separately incorporated, is commercially a suburb of Spokane, being almost surrounded by the northeastern additions of that city. The Great Northern railway maintains its shops here employing more than 1,200 men, and enlargements are being planned. A box factory and the sorting and planing plant of the Diamond Match Company are also located here. Within its limits are two miles of paved streets and 2½ miles of sidewalk. It maintains a fire department, four school buildings, including a high school, and a weekly newspaper. In addition to Great Northern railway transportation, electric cars run every 15 minutes to Spokane, while stages operate to Newport and Deer Park and way points. Factory sites are plentiful and electric power is supplied by the Washington Water Power Company.

Latah: Altitude 2,442 feet. Population 1920, 330. A farming town located on the Oregon-Washington railroad, 42 miles southeast of Spokane, in the midst of a rich rolling prairie. A four-year high school, four churches, and three fraternities are maintained. Four passenger and four freight trains stop daily.

Mead: Altitude 1,907 feet. A farming town of about 100 population, located on the Great Northern railway, nine miles north of Spokane. Two brickyards and several stores and a branch of the Diamond Match Company represent the industrial and business activities of the town. A church, high school and two fraternities are supported.

Medical Lake: Altitude 2,437 feet. Population 1910, 1,730 (including inmates of state hospital and school). Present local estimate for town itself 600. Area in corporate limits 640 acres. Town is prettily situated about 12 miles southwest of Spokane on the shores of Medical Lake, said to have unusual medicinal qualities for curing rheumatism. A monumental cut-stone works and a granite

quarry which yields superior stone employ a number of men. There are also four general merchandise stores, three garages, two blacksmith shops, machine shop, lumber yard, two coal yards, and two pavilions and bath houses. A sanitarium would do well. A four-year high school, five churches, five fraternities and a public park and volunteer fire department are supported. The Washington Central branch of the Northern Pacific railway and an electric interurban connects with Spokane, and the Sunset Highway passes within four miles.

Milan: Elevation 1,780 feet. A farming community of about 300 people, located on the Great Northern railway, 25 miles north of Spokane. Lumber manufacturing, dairying and stock raising are the sustaining industries. School and church facilities are provided.

Rockford: Elevation 2,665 feet. Population, 1920 census, 435. Area 450 acres. Actual valuation of taxable wealth $600,000. Located on the Oregon-Washington railway, 25 miles northeast of Spokane, in the midst of a rolling farm country devoted to wheat, oats, seed peas, and diversified crops. It has a bank, two grain warehouses, a grain elevator, two garages, two general merchandise stores, two drug stores, meat market, a weekly newspaper, five churches, a public park, a four-year high school, paved streets and good water supply. Four passenger and two freight trains stop daily.

Spangle: Elevation 2,432 feet. Population 1920, 291. Located on the Northern Pacific railway at the gateway to the Palouse, 20 miles south of Spokane. Surrounding lands are devoted to grain, fruit and livestock. A bank, several grain warehouses, a four-year high school, church facilities and electric lights are enjoyed.

Spokane, the "Power City": County seat. Altitude 1,891 feet. Population, 1920 census, 104,437. Area in corporate limits 39½ square miles. Actual value of all taxable property $226,462,890.

This is the second city in population in the State of Washington and the financial, commercial and industrial center of the "Inland Empire," embracing an area of 150,000 square miles. Its location is almost central in the county, 350 miles east of Seattle, 375 miles northeast of Portland and midway between the international boundary line and the state of Oregon. It is built on a plain through which flows the Spokane river, along both sides of which extends the business section of the city with the residence districts mingling with the low-lying foothills beyond. The city pride is reflected in the character of the homes and public buildings and by the extensive park and boulevard systems, all built to conform with the natural contour and surroundings.

The rapid growth of this city from a little village in 1880 to the great metropolis of today has been brought about by mining, agriculture, water power, lumbering and other manufacturing and commerce. A number of the richest mines in the world are tributary, returning $12,000,000 a year in dividends, and the output is expected to increase for years to come.

Among the most powerful influences that have contributed to a rapid industrial growth is the immense tributary water power. The Spokane river drops 1,280 feet in 100 miles, making possible 400,000 horsepower. Already 172,000 horsepower have been developed and used for lighting and driving electric cars, and manufacturing. One of the great falls is within three blocks of the business center of the city.

In 1914 the United States census bureau credited the city with 277 manufacturing plants, capitalized at $18,891,450 and an output for the year of $16,636,307. These figures, however, do not include the large enterprises just outside the city, which are practically as much a part of the city as those within the corporate limits. Estimates by the Chamber of Commerce place the output of 240 establishments, employing 9,488 men in 1918, at $48,285,600. The products include paper, lumber, sashes and doors, flour and feed, drygoods and clothing, packed meats and other canned and preserved foods, bread and baking products; brick, clay and cement products; carriages and wagons; confectionery; copper, tin and sheet iron; foundry and machine shop products; printing and publishing, and numerous other miscellaneous commodities.

Its wholesale trade amounts to $30,000,000 yearly and extends as far west as Ellensburg; east as far

as Butte, Montana; and to Pendleton, Oregon, and Pocatello, Idaho, toward the southwest and southeast. Clearings of its 14 banks in 1918 amounted to $421,558,970.

Spokane is one of the most important railroad centers west of the Mississippi river. The railroads entering are the main lines of the Northern Pacific, Great Northern, Chicago, Milwaukee & St. Paul, Spokane, Portland & Seattle, and Oregon-Washington Railroad & Navigation Company, and a branch of the Canadian Pacific. Over these tracks also enter the Chicago, Burlington & Quincy, the Spokane Falls & Northern and the Chicago & Northwestern, while a number of branch lines connect with these main lines within the city limits. It is also the hub of an electric interurban system, running to Cheney, Medical Lake and Coeur d'Alene, Idaho, and as far south as Colfax.

Among its educational institutions are two large modern high schools with 3,000 students, 35 grade schools, and 13 private schools, including Gonzaga College, with over 600 students, Spokane College, Spokane University, Whitworth College and a number of other parochial schools and commercial and art academies. The city also has a public library with four branches, containing 74,000 volumes, 140 churches including all denominations, a Y. M. C. A., a Y. W. C. A., 13 theaters, a $2,000,000 hotel, three big daily newspapers, eight weeklies, three monthlies, one semi-monthly, and one twice-a-week.

In park area per capita, the city ranks first in the United States. The total value of its 43 parks containing 1,937 acres is $2,000,000. Fourteen fire stations employing 146 men, with all modern equipment including motor propelled machines, reduce the chances of loss by fire to a minimum. The city has 920 miles of streets, 634 miles concrete walk, 72 miles paved streets, 34 bridges, 140 miles of gas main, 137 miles street railway, 145 miles of sewer, 356 miles of water pipe, 1,840 arc lights, and 24,516 telephones.

Drinking water is unsurpassed and the death rate is lowest for all cities of this size, except one, in the United States. Two great fairs are held annually, viz., the Spokane Interstate Fair in September and the National Apple Show in November.

Waverly: Elevation 2,376 feet. Population 1920, 234. A farming center on the Spokane, Portland & Seattle and Oregon-Washington railroads and the Inland Empire Highway, 34 miles south of Spokane. It has a bank, garage, large warehouse, a four-year high school, two churches and a feed mill.

WHITMAN COUNTY.

This county, lying just north of the Snake river close to the Idaho boundary line, comprises most of what is known as the Palouse country. It is the banner county in the state in the production of wheat and one of the leading counties of the entire United States in total agricultural output.

Topography: The surface is neither rough nor level; it consists generally of a continuous undulating prairie covered with round top hills, which have rather long gentle southwesterly slopes but recede rather abruptly on the northern sides. The elevation as a whole ranges from 1,500 feet in the southwest to about 2,000 feet in the northwestern sections and 2,500 feet in the eastern townships, where two eminences reach a height of more than 3,600 feet. Along the Snake river the altitude ranges from 500 to 700 feet. There is no timber except a few scattering trees on some of the craggy bluffs and some soft woods along the courses of the running streams.

Soil: The soil is fairly uniform throughout the county except that it is somewhat lighter toward the western boundary than in the eastern portion. It is chiefly a basaltic loam of fine texture containing considerable organic matter and just sufficient mineral nutrients to make it ideal for the growth of grains, forage, fruit and vegetable crops. It extends down to bedrock, often a hundred feet below the surface, and is as fertile on the round hilltops as on the plains. It is clear of gravel and rock and yields readily to plow and cultivator. Although wheat is the main crop, truck farming, fruit raising, and poultry raising would be profitable on ordinary-sized tracts.

Climate: The climate is vigorous and healthful. Annual mean temperature is about 48 degrees. The average range is from a mean monthly minimum of 23.5 degrees in January to a mean monthly maximum of 82.8 degrees in July and August. Annual precipitation ranges from about 16 inches in the western area to about 22 inches near the eastern boundary. Growing period is about 120 days. Sudden or radical changes seldom occur. The winters are short and summers long and comfortable.

Lands: The entire land area amounts to 1,349,120 acres. All but 2,357 acres of unreserved and unappropriated government lands and 32,208 acres of state lands have passed into private ownership. Nearly a million acres have been placed under the plow and made to contribute to the great agricultural output of the county. No other county in the state has so large an actual area or percentage of its total area under cultivation. The remainder of the county is good for pasture. Only about 2,000 acres, lying principally along the Snake and Palouse rivers, are irrigated.

Prices of Land: The yield per acre and the value of wheat are the principal factors governing prices in this county. The cheapest lands are toward the southwest corner, where the soil is lightest. The prices for improved lands in this locality range from $50 to $75. From the center of the county toward the northwest prices run from $75 to $100; the eastern half ranges generally from $100 to $150, with certain pieces close to the largest centers, where other improvements besides wheat are included, reaching $200 or $250. Most of the land yet unimproved is valuable only for grazing, and will range from $15 to $40 an acre. The majority of the improved farms contain from 100 to 500 acres, with many up to a thousand acres or over. The tendency is to increase still more the individual holdings. By more intensive methods, however, the richness of the soil would warrant much smaller tracts for individual farms.

Resources and Industries: This is the leading grain producing county in the state. Close to 15,000,000 bushels of wheat, oats and barley are produced annually, about two-thirds of the whole being wheat. A comparatively new industry of importance is the raising of seed peas which is found very profitable in the northeastern sections. Potatoes, hay, fruits and berries also yield well when given proper opportunity. Whitman also ranks first in the total value of all livestock, according to the 1919 valuations, Yakima county falling only a few thousand dollars behind. Horses are by far the most important and it may be said that there is a horse or a mule for nearly every man, woman and child in the county, there being 30,000 horses and 2,700 mules. About 17,000 hogs, or more than one-eighth of all in the state, were counted and the same enumeration shows 20,000 sheep, 13,000 stock cattle, and 7,000 milch cows. Total value of all, including poultry, amounted in 1919 to about $6,000,000. Dairying is steadily increasing and creameries are maintained at Colfax, Palouse, Tekoa and Pullman.

Fruit raising is no small factor. There are about 186,000 apple trees, 9,000 pear trees, 83,000 peach trees, 14,000 cherry, 7,000 plum and prune, and 6,500 apricot trees. The principal horticultural section is along the Columbia river.

Among mineral deposits, clay, granite and gold have been found. Water power exists in the Palouse river. Artesian wells are frequent. Surface wells of pure water average 40 feet on the eastern half and 80 feet in the western part of the county. Aggregate actual value of all taxable wealth, in which respect this county ranks fourth in the state, amounts to about $120,000,000, or about $3,000 per capita.

Transportation and Highways: The county as a whole is exceptionally well served with railroads. A total of 512 miles of steam road and 83 miles of electric road are maintained. The steam roads include 310 miles by the Oregon-Washington Railway and Navigation Company, 108 miles by the Northern Pacific, 74 miles by the Chicago, Milwaukee & St. Paul, 15 miles by the Spokane, Portland & Seattle, and six miles by the Washington, Idaho & Montana. Electric cars are provided by the Spokane & Inland Empire Electric Railway, which serves all points in the eastern section as far south as Colfax. A good road passes in front of practically every farm gate. More

than 2,500 miles are in use, including the two routes of the Inland Empire state highway. About 170 miles in the county are surfaced with crushed rock or oil macadam. Additional transportation facilities are provided by regular steamers on the Snake river between Riparia and Lewiston.

Markets: Sevénteen incorporated cities and many other railroad shipping stations with large warehouses facilitate the handling of grain. The main market for exporting grain is Tacoma; for milling grain, Spokane; for dairy products, Spokane and Lewiston, Idaho. Most of the other products are consumed locally.

Population: The 1910 census credited the county with a population of 33280, or 15.8 to the square mile, an increase of 31.27 per cent in ten years. The population for 1920 is 31,323, or 14.8 to the square mile. The most thickly inhabited parts are in the eastern townships; about 50 per cent of the whole are found in 17 incorporated cities, with population ranging from 300 to several thousand. Among the foreign-born elements are Russians, Canadians, Scandinavians and English.

Social Conditions: This county is a leader in per capita wealth and in social and educational progress. Although the farms are large and the population of the rural districts correspondingly thin, yet the proximity to leading educational centers and the transportation facilities accorded place the best advantages within easy reach of all. At Pullman is located the State College of Washington, one of the leading educational institutions in the Northwest. Besides work in all the usual collegiate lines, special attention is given to scientific agriculture. In connection with it a college farm of 573 acres for experiment purposes is supported jointly by the state and federal government. Just across the line, at Moscow, is the University of Idaho, while Spokane and Lewiston are reached in a comparatively brief period by rail or over the Inland Empire Highway. The county ranks first in the number of school districts (175) and the number of rural mail routes (40), and third in the number of high school districts (27). There are also six private schools, churches of all denominations in the leading towns, 39 postoffices, and 3,381 miles of telephone wire. Nearly every farm supports at least one automobile and the entire county has one for about every seven persons.

CITIES AND TOWNS.

Albion: Altitude 2,250 feet. Population 1920, 252. A farming town on the south Palouse river and the Oregon-Washington railroad, about 14 miles southeast of Colfax. It has a bank, several grain warehouses, high school, three churches, four fraternities, and two general stores.

Colfax: County seat. Altitude 1,966 feet. Population 1910 census, 2,783. Census of 1920, 3,037. Incorporated area 748 acres. This, one of the oldest and wealthiest towns in eastern Washington, is located in the Palouse river valley, 63 miles south of Spokane, on the Oregon-Washington and Spokane & Inland Empire railways and the Inland Empire Highway. The town has been built up entirely by the development of the surrounding rich farm lands and its local industries are prompted by the needs of a community devoted to wheat, stock and dairy farming. These include numerous warehouses, a 500-barrel flour mill, foundry and machine shop, grain elevator, a plant making household utensils, a creamery, six garages, four banks with deposits averaging over $1,000 per capita, and two weekly newspapers. The city has 10 churches, a four-year high school, 12 fraternal organizations, electric lights and power, a water system from artesian wells, a paid fire department and two parks, one of which is a free auto camping ground. It also enjoys six miles of paved street, about 11 miles of sidewalk, and a modern sewerage system. Actual valuation of all assessed property is $4,043,656, or about $1,200 per capita.

Colton: Altitude 2,564 feet. Population 1920, 382, mostly German or of German descent. Located in a rich wheat region in southeast corner of county, on the Genessee branch of the Northern Pacific railway. It has a 300-barrel flouring mill, three garages, blacksmith shop, a newspaper, bank, two churches, four fraternities, a four-year high school, and an academy for girls. It is provided with a municipal water system and electric lights.

Elberton: Elevation 2,189 feet. Population 1920, 244. A farming

center on the O.-W. railroad and the north fork of Palouse river, 13 miles northeast of Colfax. It has a bank, flour mill, prune evaporator, two churches and a high school.

Endicott: Altitude 1,593 feet. Population 1910, 474; census of 1920, 634. Situated in a wheat section, on the Oregon-Washington railway, 19 miles west of Colfax. It is one of the largest wheat shipping centers in the county and maintains two large warehouses covering an acre of ground and a grain elevator of 40,000 bushels capacity. Three churches, a high school, six fraternities, weekly newspaper, a bank, two lumber yards and three garages are supported. City has electric lights, water works and two miles of sidewalk.

Farmington: Altitude 2,630 feet. Population 1910, 489; 1920 census, 479. Situated at the edge of the county, on the Oregon-Washington and Northern Pacific railways, 23 miles northeast of Colfax. Sustaining enterprises are wheat farming, cattle raising, horticulture and dairying. It is a heavy shipper of grain and operates several grain warehouses. A bank, four churches, a high school, a newspaper and electric lights are maintained. Water is obtained from artesian wells.

Garfield: Altitude 2,485 feet. Population, 1920 census, 752. A farming and railroad center, situated on the Oregon-Washington, Northern Pacific, and Spokane & Inland Empire railroads, 18 miles northeast of Colfax, in the midst of a very rich farming country. Wheat, hogs and peas are grown in abundance. Dairying, fruit raising and poultry are also successful. About 400,000 bushels of wheat and large quantities of fruits, vegetables and livestock products are shipped through its several warehouses. City has a flour mill, two banks, a bakery, three garages, two hardware and implement concerns, opera house, a four-year high school, six churches, two parks with total area of 13 acres, a newspaper, nine fraternities, electric lights, municipal water, modern sewerage system, paved streets and cement walks. Buildings are nearly all of brick.

La Crosse: Elevation 1,472 feet. A city of about 800 people in the center of a rich wheat and stock region, on the Oregon-Washington main line, 26 miles southwest of Colfax. Town has a large territory to support it and is rapidly growing. It has a flour mill, a blacksmith and machine shop, two banks, weekly newspaper, four grain warehouses, one grain elevator, two garages, three churches, a four-year high school, three fraternities, a farmers' educational and cooperative union, paved streets and good water supply.

Lamont: Altitude 1,947 feet. A town of about 200 population, located on the Spokane, Portland & Seattle railway, in the northwestern corner of the county and supported by a prosperous wheat and stock raising section. City has a bank, grain elevator, several warehouses, high school, church and newspaper.

Malden: Altitude 2,070 feet. Population 1910, 789; 1920 census, 1,005. A division point of the Chicago, Milwaukee & St. Paul railway, 30 miles north of Colfax. Corn and wheat, the principal crops, grow here without irrigation. Stock raising is also important. The town has water system, electric lights, high school, two churches, a bank and weekly newspaper.

Oakesdale: Altitude 2,465 feet. Population, 1920 census, 816. A junction point of the Oregon-Washington, Northern Pacific, and Spokane & Inland Empire railways located in the northeast section of the county, on the Inland Empire Highway, 46 miles south of Spokane. Surrounding it is some of the richest farming and grain land in the state, the returns from which pass through this city. Railroad work also provides support for some of the people. It has eight warehouses, one grain elevator, a flour mill, a chopping and cleaning mill, six churches, two banks, three garages, a four-year high school, a newspaper, and concrete walks.

Palouse: Altitude 2,430 feet. Population, 1920 census, 1,179. The town is located 18 miles due east of Colfax and a mile and a half from the state line, at the junction of the Northern Pacific, the Washington, Idaho & Montana, and the Spokane & Inland Empire railways. The residence district is picturesquely arranged in terraces on three hills overlooking the business section, built along the river. It is the trad-

ing point for an extensive and very productive agricultural area and the gateway to the timber regions of Idaho. Agriculture is its mainstay. Among the local enterprises are a flour mill, a grain elevator, steam laundry, wagon and blacksmith shop, two banks, and a newspaper. It has a four-year high school, six churches, a public park, eight fraternal organizations, artesian water, electric lights, modern sewerage system and paved business streets.

Pullman: Altitude 2,340 feet. Population, 1920 census, 2,440, not including students at the State College. Situated at the junction of the Oregon-Washington and Northern Pacific railways, and on the Inland Empire Highway, in the southeastern part of the county. It is the largest city in the county and one of the most important in eastern Washington. It is the home of the State College, one of the leading educational institutions in the West, representing an outlay of $2,000,000 in farms, campus and buildings. It is also the distributing center of a magnificent farming country, yielding heavily of wheat, livestock, fruit and dairy products. Several large warehouses and grain elevators are busy handling the output. Almost a million bushels of wheat are shipped yearly. Bank deposits amount to about $1,500,000. The city has a flour mill, grist mill, two banks, a bottling works, weekly newspaper, creamery, planing mill, ice plant, a four-year high school, seven churches, 18 artesian wells, one with a flow of 2,400 barrels per minute, 5½ miles of paved street, and 12 miles of cement sidewalk. Its taxable wealth is $2,000,000.

Rosalia: Altitude 2,200 feet. Population 1920, 714. Located on the Inland Empire Highway, 55 miles south of Spokane, at the junction of the Chicago, Milwaukee & St. Paul, the Northern Pacific, and Spokane & Inland Empire railways. A rich wheat, dairy and fruit section surrounds it. Several big warehouses are kept busy. City has a weekly newspaper, two banks, a four-year high school, several churches, a city park, electric lights and excellent water supply.

St. John: Altitude 1,963 feet. Population 1910, 421; 1920 census, 597. A farm town on a branch line of the Oregon-Washington railroad in Pleasant valley, 22 miles southwest of Oakesdale. It supports a newspaper, two banks, a number of fraternities, four churches, and a high school.

Tekoa: Altitude 2,537 feet. Population 1910 census, 1,694. Census of 1920, 1,520. This is the third city in size and importance in the county. It is located in the extreme northeastern corner and is a railway hub for the Chicago, Milwaukee & St. Paul and Oregon-Washington railways, which radiate in five different directions from the town. The immediate vicinity is devoted to wheat farming, dairying and stock raising. A little yellow pine, fir and tamarack timber stands 12 miles east in Idaho. Large shipments of wheat, oats, livestock and fruit are made. It has four large warehouses, a grist mill, chop and feed mill, a newspaper, two banks, a four-year high school, six churches, five fraternal organizations, artesian wells and volunteer fire department.

Thornton: A farming center of about 300 people, located on the Oregon-Washington and Spokane & Inland Empire railways, 18 miles north of Colfax. It has a bank, several warehouses, high school and church facilities.

Uniontown: Altitude 2,570 feet. Population, 1920 census, 404. Situated in the midst of a rich agricultural section on the Northern Pacific railway, 10 miles north of Lewiston, Idaho. In addition to wheat, cattle and hogs are important products. It has a brick yard, bank, two garages, several warehouses and business houses, also a high school, two churches, weekly paper, electric lights, four fraternities, paved street, good water supply and volunteer fire department.

Winona: Altitude 1,484 feet. A farming village of about 300 population, at the junction of two branches of the Oregon-Washington railway. Surrounding country is specially adapted for bluestem wheat but dairying, hay and stock are also important and fruit and poultry are successful. Many carloads of cattle, hogs and horses also have been shipped. The town has a bank, grist mill, warehouses, weekly paper and high school.

Wheat in the Palouse. Washington's annual wheat crop runs from 30,000,000 to 50,000,000 bushels.

Southeast Washington.

ASOTIN COUNTY.

This is one of the smallest counties in the state. It is located in the extreme southeastern corner and is separated from the state of Idaho by the Snake river. The state of Oregon forms the southern boundary.

Topography: It slopes from the Blue mountains in the southwest, with an elevation of about 4,500 feet, toward the navigable Snake river, bounding it on the east and north, at an elevation of about 700 feet. Its surface is cut by a number of small streams and coulees, forming many narrow valleys and low areas irrigable from springs and creeks. About 40 per cent of its surface is mountainous, about 30 per cent rolling, and the other 30 per cent including plateaus, bottom lands and bench lands, comparatively level.

Population: The population in 1910 was 5,853, including an increase of about 75 per cent in 10 years. The 1920 census recorded a total of 6,539, the majority of whom live in the vicinity of Clarkston and Asotin, the two largest cities. School census of 1919 enumerated 2,010 of school age.

Soil and Climate: The soil is from two to ten feet deep. The lower benches consist of volcanic ash and the higher altitudes of varying light to heavy loam. Like the neighboring country, uplands are best suited to the production of wheat, barley, oats and timothy. In the valleys and wherever irrigation is practiced, fruit, truck and alfalfa reach the highest degree of perfection. Two full crops of strawberries and as many as three crops of potatoes have been known to mature near Asotin, the county seat. The English walnut seems to do well here and even some semi-tropical crops such as sweet potatoes and peanuts. Rainfall near Clarkston is about 13 inches with a maximum of 6 to 12 inches of snow. A long warm growing season is enjoyed. Temperature goes occasionally high but with low humidity.

Lands: The total land area is 387,840 acres, of which 54,400 acres are held in the Wenaha forest reserve, 20,463 acres are state lands, and 16,137 are government lands, subject to filing, and described as "mountainous, grazing or farming." This leaves in private ownership about 296,000 acres, much of which may be purchased on reasonable terms. About 90,000 acres of this have been improved, including about 10,000 under irrigation. Much of the remaining 175,000 acres can also be improved in time, but most of it is now suitable for grazing only.

Prices of Land: Lands suitable for grazing only are worth about $10 an acre; wheat lands, $40 to $60; irrigated hay lands with water rights, about $200, and orchard lands, $200 and up. Unimproved agricultural lands may be bought for $40 an acre.

Resources and Industries: The natural resources are the pine timber belts enveloping the Blue mountains, various minerals, water power, and agricultural lands. Only the last of these has been developed to any degree, but the other four hold out great prospects as the region grows and transportation advantages are increased. About 3,000 horsepower has been generated in Asotin creek but an unlimited quantity is going to waste in the Grand Ronde river, which flows into the Snake river in the southern end of county. A small amount of lumber is also manufactured.

The leading agricultural crop is wheat, of which about 500,000 bushels are raised yearly. About 150,000 bushels of oats are produced and smaller quantities of corn, barley and rye. It is also a very important stock region. In 1919 there were about 20,000 sheep, 8,000 cattle, 800 milch cows, 3,000 hogs and 5,000 horses. Poultry raising, dairying, fruit growing, diversified farming and truck gardening have

been proved profitable, especially in the irrigated region around Clarkston and Asotin.

Mining possibilities include large bodies of lignite coal and some of the greatest lime deposits known. Copper and gold have also been found in the southeastern corner.

Transportation and Highways: There are no steam railroads within the county limits, but that is no drawback to most of the population, which lives in the northeast corner of the county and within a few minutes drive of Lewiston, Idaho, where rail connection can be made for any city in the Northwest. People living further down the Snake river can cross to the Camas Prairie line and catch Oregon-Washington or Northern Pacific trains, winding along the north bank of the river. Fairly good highways penetrate the southern and eastern parts of the county and connect with the eastern route of the Inland Empire, a link in the Evergreen Highway, passing through the northern section. The Snake river, too, is navigable all the way to its mouth.

Markets: Local packing and commission houses at Asotin, Clarkston, and Lewiston, Idaho, handle most of the products, shipping the greater portion of the fruit to the large mining towns of Montana, the Dakotas, Minnesota, British Columbia and Manitoba, where good prices are always obtained. Much wheat goes to Spokane or the Coast cities.

Social Conditions: The towns are possessed of all the usual comforts and conveniences. The county is divided into 31 school districts and high schools are established at Anatone, Asotin, Clarkston and Cloverland. These towns have regular churches but the outlying districts use the schoolhouses for such purposes, also for other public meetings. Fraternities and women's clubs are represented and mail service is rendered by 10 postoffices, with a rural route out from Clarkston. There are about 500 automobiles and 980 miles of telephone wire.

CITIES AND TOWNS.

Anatone: Elevation 2,800 feet. A farming town of about 250 people near center of county. It has a church, high school, a park, paved street, and volunteer fire department. Stages run to Asotin, 18 miles northeast.

Asotin: County seat. Population 1910, 820; census of 1920, 852. Elevation 760 feet. Prettily located on the Snake river, five miles south of Clarkston. Farm products, grapes and orchard fruits grow readily. City has an electric plant, flour mill of 100-barrel daily capacity, large grain warehouse, and a cement plant. Five church denominations and six fraternities are represented. It has a four-year high school, weekly newspaper, municipal water system, electric lights, volunteer fire department and a large city park of unusual natural beauty. Five blocks of street and all sidewalks are paved. Asotin creek is crossed by a $100,000 concrete bridge dedicated to the soldiers who went overseas.

Clarkston: Altitude 825 feet. Population 1910, 1,257; 1920 census, 1,859. It boasts the justly celebrated "Vineland" district where irrigation is rapidly making of that valley one of the wonder spots on the American continent. Clarkston is so closely allied with Lewiston, Idaho, on account of the big steel suspension bridge and street cars connecting the two municipalities, that the interests of the two are almost identical. It is an important shipping center for the products of a large and growing territory rich in possibilities for fruit culture, grain production and stock raising. Among its industries are a box factory, sash and door factory, large fruit cannery and two fruit packing houses. It has two banks, one weekly and one daily newspaper, 10 churches, four-year high school and three grade school buildings, three public parks comprising 12 acres, a public library, electric plant and paid fire department. The Northern Pacific and Oregon-Washington railroads have terminals at Lewiston.

Cloverland: Altitude 2,250 feet. A town of about 100 population, 14 miles southwest of Asotin. It is surrounded by 5 and 10-acre irrigated orchard tracts. Daily stages connect with Asotin.

GARFIELD COUNTY.

This, the panhandle-shaped county in the southeastern part of the state, is about 50 miles in length and ranges in width from six miles at the Oregon boundary to 30 miles in the north central section.

Topography: Its general topography is similar to counties on either side. The narrow strip to the south is occupied by the Blue mountains and constitutes a part of the Wenaha forest reserve. It is quite heavily timbered and unsurveyed. The Pataha river, which finds its source here, and Deadman creek in the northern section are the main drainage mediums. Near these streams and in a few places along the Snake river a little irrigation is practiced, possibly not more than 2,000 acres in all. All the remainder of the county is a rolling plateau slightly broken in places and with an average elevation of between 1,500 and 2,200 feet.

Soil and Climate: Soil is principally a basaltic loam very rich in potash and lime and well supplied with phosphoric acid and nitrogen. The heaviest soils are in the northeast and southern sections, that in the west and northwest being comparatively light. Almost any crops do well, but wheat and barley are most important. Beans, corn, alfalfa and fruit are produced in small quantities, especially on the small irrigated tracts along the Snake and Pataha rivers. Annual precipitation at Pomeroy is 19.58 inches. The mean monthly temperature varies from 32.5 in January to 70.6 degrees in August. Growing season is probably 150 days.

Lands: Total land area amounts to 444,160 acres. Of this, 98,415 acres are included in the Wenaha forest reserve and 10,411 acres are state lands, but only 1,267 acres remain unreserved and unappropriated subject to homesteading. Practically all the remainder is privately owned and fenced, one-half or about 160,000 acres being under cultivation. About 10,000 acres more will be suitable for cultivation when cleared and the remaining will be most suitable for grazing and stock raising.

Prices of Land: Unimproved tillable lands are purchasable for between $10 and $20 per acre. Improved hay land sells for from $50 to $80, wheat lands from $60 to $100, and orchards, of which there is a little along the Snake river and in the Pataha valley, may be had for from $200 to $500 per acre. There are frequent chances to lease at one-third to two-fifths of crop delivered at warehouse.

Resources and Industries: Agricultural resources are practically the mainstay of the county. The only timber, consisting of about 300,000,000 board feet of pine, is in the Wenaha reserve. Much water power can be developed when needed in the Pataha and Alpowa creeks. There is also considerable in the upper Tucannon river in the government reserve but it is not available yet. No minerals except brick clay, onyx and granite have been discovered. The main crop is grain, which amounts to about 2,500,000 bushels annually, principally wheat and barley. Beans, corn, alfalfa and fruits are produced in limited quantities. Many sheep and hogs and some splendid cattle and horses are raised. About 7,000 stock cattle, 1,000 milch cows, 4,500 horses, 4,200 hogs and 15,000 sheep are credited to the county. The principal fruits are peaches, plums and prunes. Altogether there are about 115,000 fruit trees, including 58,000 peach trees and 30,000 plum and prune trees. The remainder is made up of apricots, cherries and apples.

Transportation and Markets: Steamboat service is enjoyed by the settlements along the Snake river, regular trips being made between Central Ferry and Asotin. The Oregon-Washington Railway & Navigation Company operates a branch from Starbuck to Pomeroy and another along the north bank of the Snake river. The Central Washington highway penetrates from west to east and connects with other roads leading to all parts of the county. Most of the grain is shipped through Pomeroy.

Population: The U. S. census of 1910 recorded a population of 4,199.

The 1920 census recorded 3,875, the decrease being due to the same causes affecting other wheat regions where the average size of farms increases instead of diminishes.

Social Conditions: Schoolhouses and church facilities are within easy reach of all. The residences are made homelike and numerous automobiles are seen on the highways. The county is divided into 35 school districts, and a four-year high school and private school are provided at Pomeroy. Mail is distributed by four postoffices, with three rural routes from Pomeroy. Quick communication is possible with 902 miles of telephone wire and 31 miles of telegraph. School entertainments and fairs are held at the various schoolhouses.

CITIES AND TOWNS.

Pataha: A farming town of about 100 people, 3½ miles east of Pomeroy. It has a chop mill, flour mill, church, garage and blacksmith shop.

Pomeroy: County seat. Altitude 1,849 feet. Population 1910 census, 1,605. Present estimate 1,800. It is the terminus of a branch line of the Oregon-Washington railway, the center of the grain belt, and the only city and principal shipping point in the county. It is very prettily located amidst shade trees and hills with the Pataha river flowing through. Business buildings are mostly brick; streets are paved and walks are cement. Principal business lines include a flour mill, feed chop mill, three banks, seven garages, weekly newspaper, theater, and several good hotels. Five churches, a four-year high school and two private schools are supported. One of the special features is a pretty auto camping park which attracts many tourists in summer.

COLUMBIA COUNTY.

Columbia county nestling between Walla Walla and Garfield counties in the southeastern part of the state has the navigable Snake river for its northern boundary and the state line on the south.

Topography: Its total area is 858 square miles, the southern portion of which lies in the Blue mountains and constitutes a part of the Wenaha forest reserve. The Touchet river rises in this range, its tributaries traversing deep canyons as they drain the southern part of the county into the main stream. The northern section is drained by the Tucannon and its tributaries into the Snake. Fertile, but narrow, valleys are formed by these rivers, while on the hills above are broad expanses of rich rolling grain land. General altitude is from 600 to 2,700 feet.

Soil and Climate: Two main types of soil prevail. These are the basaltic loam, a wind-blown soil covering the larger part of the county, and the valley bottoms along the Touchet and Tucannon rivers. These latter are very limited in extent but the land is very rich. Some of the most prosperous orchards in the state are in the Touchet valley below Dayton. The soils of the higher elevations are deep, and rich in plant material, yielding heavy crops of grain. Precipitation averages 12 inches at Starbuck, 22 inches at Dayton and 27 inches in the Blue mountains. Growing season at Dayton is 156 days.

Lands: There are altogether 549,120 acres of land in the county, including 158,093 acres in the forest reserve, 1,702 acres open to homesteading and 14,398 acres of state lands. This leaves about 360,000 acres in private ownership, nearly all of which is in about 700 farms and about one-half is improved. One especially large farm contains about 30,000 acres. Approximately one-half the county is tillable and the remainder suitable for pasture. There is some logged-off area on the foothills adjoining the timber, but the stumps are comparatively small.

Prices of Land: The prices of best grain lands range from $125 to $200 an acre, but some of the lighter lands can be bought for $40 or $50 per acre. Some pasture land good for sheep is available at $10 to $15. Valley lands suitable for alfalfa and fruit run as high as $500, occasional pieces of fruit land in the Touchet valley going to $1,000.

Resources and Industries: The only commercial timber is in the forest reserve. Clay is found near Dayton and considerable water power flows away in the Touchet and

Tucannon rivers. The main industry is the raising of wheat and barley which together amount to about 2,500,000 bushels annually. This is the leading barley county in the state. About 100,000 bushels of corn are also raised. Stock raising is receiving much encouragement, especially sheep, of which about 20,000 were counted in the spring of 1919. The heaviest fleece known was sheared in this county. Beef cattle and hogs receive much attention. There are also about 1,600 mules and more than 6,000 horses, including many thorobreds.

Transportation and Markets: The Oregon-Washington Railway & Navigation Company's main line serves the western townships and operates one branch to Dayton and Turner and another east from Starbuck to Pomeroy in Garfield county. A branch of the Northern Pacific runs from Walla Walla to Dayton. On the northern boundary the Snake river is navigable the full distance. Stages operate between the principal points and Walla Walla. Most of the produce is hauled to Dayton, Turner, Starbuck and intermediate points whence it is shipped to the markets of the world.

Population: The 1910 census recorded 7,042, but only 6,093 were counted in 1920, the average size of farms increasing instead of diminishing. The majority live in the cities and along the Touchet and Tucannon rivers. The grain farms are usually very large and population correspondingly scattered.

Social Conditions: The county is divided into 44 school districts, and high schools are maintained at Dayton, Starbuck and Turner. Churches are located where needed and rural telephone service is well established. There are five postoffices and five rural routes and about 1,868 miles of telephone wire. A county fair is held at Dayton each September.

CITIES AND TOWNS.

Dayton: County seat. Altitude 1,615 feet. Population, 1920 census, 2,645. Assessed valuation $1,068,030. Situated near the geographical center of the county in a broad valley, at the intersection of the Touchet river and Patit creek, on the Northern Pacific and Oregon-Washington railways. It is substantially built and is known as the "city of shady walks and pleasant lawns." Business streets are paved and sidewalks are cement. It is the chief export and distributing point in this region. It has a number of warehouses, a 300-barrel flour mill, a creamery, a feed mill, two banks, six garages, three newspapers, four-year high school, three grade schools, a modern concrete courthouse, large business blocks, good water system, electric lights, volunteer fire department and a free auto camping ground.

Huntsville: Elevation 1,350 feet. A community of about 200 people, in the Touchet valley, seven miles west of Dayton. It is served by the Oregon-Washington - and Northern Pacific railways and supports a flour mill, a stone quarry, a general merchandise store and two churches.

Starbuck: Altitude 644 feet. Population, 1910 census, 761; 1920 census, 524. Located on the Tucannon river, in the northern end of county, at the junction of the Pomeroy branch with the main line of the Oregon-Washington railway, which maintains shops and a roundhouse here. The town is the natural shipping point for a large tributary section. It has a bank, two garages, a theater, three churches, a seven-acre park, several fraternities and a weekly paper.

Turner: Elevation 2,173 feet. A farming center and railroad terminus 12 miles northeast of Dayton. Population about 150. Close to a half million bushels of wheat and barley are shipped annually. Four warehouses, a grain elevator, a blacksmith shop and high school are located here.

WALLA WALLA COUNTY.

The Indian name "Walla Walla," meaning "Many Waters," adorns a river, a county and a city. The Walla Walla valley is very comprehensive and includes, besides the low lands along the main river and tributary streams, the extensive rolling hills reaching in every direction and

on into the state of Oregon. All was originally covered by the ancient Lake John Day, which enveloped much of Washington, northeast Oregon and western Idaho.

Topography: Before agricultural development took place, the surface was covered with a heavy growth of bunchgrass, with light pine timber along the streams and in the mountains and foothills. All but about five per cent of mountainous area in the southeast corner, and an equal amount of level area in the valleys and on the Eureka flats, in the north central part of the county, is rolling and at times quite hilly. The general altitude increases from 350 feet along the Columbia river on the west to some 1,500 feet in the southeast, where the foothills of the Blue mountains are reached, whose greatest elevation in the county is 4,500 feet. Most of the drainage is into the Columbia river by way of the Walla Walla river, whose largest tributary streams are Mill creek, the Touchet river, and the Little Walla Walla. These streams supply excellent water for general use, also for irrigation in certain sections, but many artesian wells are also in existence and are particularly valuable for drinking water and irrigation in many places.

Population: The growth of this section has been rapid for a district where wheat raising plays so important a part. Between the years 1900 and 1910 the population increased from 18,680 to 31,931, or 70.9 per cent. The 1920 census enumerated 27,539, or 21.8 to the square mile. Nearly two-thirds live in the city of Walla Walla.

Soil: The soils of the county consist generally of deep, rich, dark-colored loams with varying mixtures of fine sand and volcanic ash. Most of it is said to be derived from rudiments of the ancient Lake John Day. It is usually well drained and contains very little alkali. The heaviest soils are around the city of Walla Walla and in the rolling hills to the east. The lowest areas nearest the streams are excellent for vegetables, fruits and alfalfa. The remainder is devoted principally to grain. Wheat yields from 30 to 60 bushels an acre.

Climate: The climatic conditions are very favorable for agricultural operations and crop failures are unknown. The precipitation at Walla Walla averages 17.7 inches. A little further east it probably increases two or three inches. Towards the west it is somewhat less. The summers are long and warm and the short winters seldom have sufficient freezing weather to supply ice for local use. Growing period is about seven months.

Lands: The county contains 809,600 acres of land, of which 2,698 acres are unreserved and unappropriated government lands; 23,655 acres are state lands subject to purchase, and a negligible portion is reserved for military purposes. This leaves in private ownership, exclusive of city and town lots, about 750,000 acres. This privately owned land is practically all in farms, 721,934 acres being reported as fenced, including about 525,000 improved. About 235,000 acres are classified as unimproved but much of this can be placed under cultivation when cleared. The remainder is thoroughly adapted for pasturage.

Prices of Land: Grazing land will fetch from $40 to $50 an acre, some of the poorest going as low as $10. Unimproved lands suitable for cultivation will fetch from $100 to $150. Wheat lands are around $150 an acre; lands good for general farming, around $200; hay lands, about $300, and orchard lands from $300 to $1,500. The highest priced lands are usually located near the chief cities.

Agricultural Pursuits: The production of wheat overshadows all other enterprises at present. The crop averages over 5,000,000 bushels annually and about the highest per acre in the state. It is not unusual for large tracts to yield an average of from 40 to 60 bushels per acre. There are also produced over 500,000 bushels of barley, 100,000 bushels of corn, close to 50,000 bushels of oats and about 30,000 tons of alfalfa. Of vegetables, potatoes and onions are the leading crops. This is also an important fruit county. Over 180,000 apple trees, 2,600 pear trees, about 6,000 peach trees, 52,000 plum and prune trees and 9,000 cherry trees, as well as about 100 acres of grapes, and considerable acreage of strawberries and bush fruits have been planted, and most are in bearing.

Dairying, stock raising and poultry add additional large incomes. In the spring of 1919 there were about 2,500 milch cows, 6,000 hogs, 35,000 sheep, 4,500 mules, about 12,000 horses and numerous poultry farms. Sheep and hogs do particularly well on account of the rich pasture available. The sheep are pastured during the summer in the Blue mountains and are wintered in the warm valleys. The average wool clip weighs 8.6 pounds compared with 6.1 pounds for the entire United States.

Manufactures, Water Power and Minerals: Manufactures consist of flour, concrete pipe, smoked meats, planing mill products, brick and tile and iron and steel products. Water power is available in the Snake and Touchet river and in Mill creek. It is estimated that about 50,000 horsepower can be developed. About the only commercial mineral is clay, which is utilized for brick and tile in several localities. Actual value of all taxable property in the county amounts to about $80,000,000.

Transportation and Highways: The county is well served with steam railroads, of which there are 324 miles provided by the Northern Pacific and the Oregon-Washington Railroad & Navigation Company, one or both of which reaching practically every postoffice in the county. Supplementing these is an electric interurban which connects the city of Walla Walla with the immediate outlying districts. Excellent roads passable the year round are maintained. The principal thorofare is the Inland Empire Highway, passing through in an east and west direction, and forming a link in the Evergreen Highway, which connects the North Pacific coast with the Mexican border. Stages operate from Walla Walla to Waitsburg and Pasco. Water transportation is also maintained on the Snake and Columbia rivers, which are navigable all the way to their outlets.

Social and Educational: Education, religion, art and social progress in all lines are generously encouraged in this old established section of the state. Education is carried on through 66 school districts, nine high schools, and nine private schools, and colleges. Nine newspapers are published and churches and cooperative clubs or associations exist in all the larger towns. Fifteen postoffices and an equal number of rural routes supply efficient mail service, and 8,161 miles of telephone wire connect up the individual farms with the cities. Auto parks are provided for the tourists and travelers, and fairs and other local exhibitions are frequent and well distributed.

CITIES AND TOWNS.

Burbank: A small town at the junction of the Columbia and Snake rivers, four miles east of Pasco. It has a creamery and general store, church and school. Crops are raised by irrigation.

College Place: A college town, three miles west of Walla Walla, on the Oregon-Washington railroad and the Walla Walla valley electric line. It was originally established as an educational center for the Seventh Day Adventists, who maintain a college and a college normal school here besides the lower grades. It has three churches, a weekly newspaper, several stores, good water supply, fire department and paved business street.

Dixie: A farming community of about 300, located 10 miles northeast of Walla Walla, on the Northern Pacific railway and Evergreen Highway. It has a church, high school, several fraternities, and general store. Stages run to Walla Walla, Waitsburg and Dayton.

Prescott: Altitude 1,017 feet. Population 1910, 502. Census of 1920, 559. Situated on the Oregon-Washington railroad, near the heart of the famous bluestem wheat belt, 20 miles north of Walla Walla. Wheat farming, horticulture, dairying and stock raising are extensively carried on in the surrounding territory. The city has a flour mill of 540-barrel capacity, several warehouses, a bank, weekly newspaper, a four-year high school, four churches, city park and good water system.

Touchet: Elevation 441 feet. A farming town of about 250 population, located on the Oregon-Washington railway, at the junction of the Walla Walla and Touchet rivers, 16 miles west of Walla Walla. It has an apple packing plant, a bank, high school, two churches, three garages, electric lights and power and volunteer fire department.

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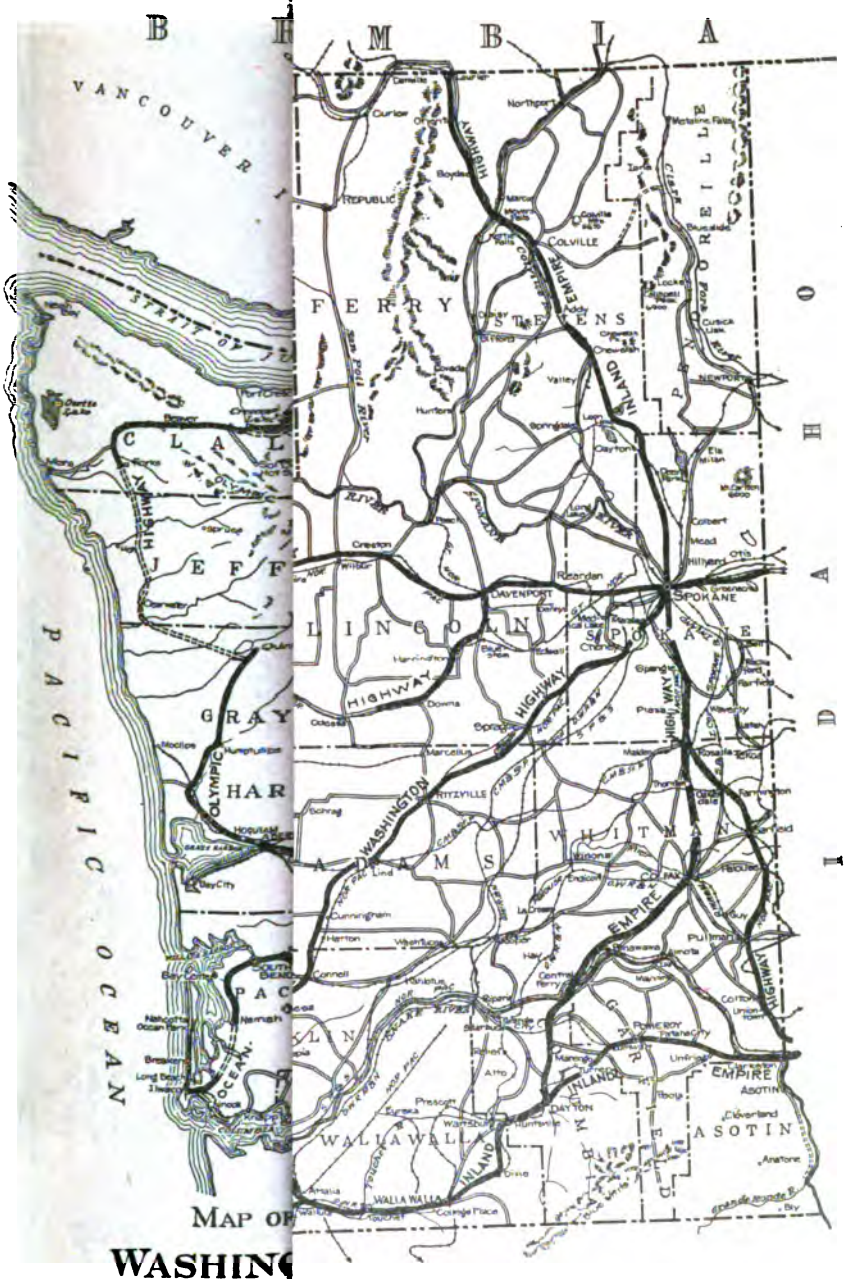

MAP OF

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State Highways

Principal County Ro

Railroads

Issued by

STATE BUREAU OF STATIST

J. Grant Hinkle, Secy of State

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State of Washington

BUREAU OF STATISTICS AND IMMIGRATION
I. M. HOWELL
SECRETARY OF STATE, EX-OFFICIO COMMISSIONER

Dairying, Poultry and Stock Raising

IN THE

State of Washington

(REVISED EDITION)

By HARRY F. GILES
Deputy Commissioner

OLYMPIA, WASH.
FRANK M. LAMBORN PUBLIC PRINTER
1916

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119°

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STATE OF WASHINGTON

DEPARTMENT OF STATE

Bureau of Statistics and Immigration

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BEEF CATTLE ON FOREST RESERVE IN THE OKANOGAN.

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A BEAUTIFUL DAIRY FARM JUST NORTH OF SPOKANE.

FOREWORD

The persistent demand for the pamphlet issued in 1912 dealing with livestock industries has never abated but has continued up to the present time even though that issue has been long since exhausted. Such a demand is partially responsible for the present publication, which has been necessarily delayed until now on account of scarcity of funds and equally urgent demands for printed information along other lines.

This publication follows the general outline of the other, but all discussions are adapted to the latest developments in the enterprises treated, new figures have been gathered, and new illustrations have been used, making altogether a practically new book. Its purpose is in no wise to teach the details of winning success in those enterprises, as that part of the work is being done as well as can be by the State College at Pullman through its experiment stations and the different county agents. The purpose is rather to awaken an interest in the raising of livestock, and to present a few facts showing the splendid possibilities for their successful management in the State of Washington.

Its contents would be expected to appeal chiefly to the prospective new citizen, desiring to know what chances there are in Washington for the industries described, besides many struggling in the busy centers of our own state, who are often ignorant of the opportunities for profitable outdoor employment lying just beyond the suburbs of the bustling city.

Due acknowledgment for all assistance received is cheerfully given the various commercial organizations, state officials, county assessors, dairymen, creamery men, merchants, and other individuals who have kindly cooperated.

CONTENTED COWS WAITING FOR THE MILKMAN—WESTERN WASHINGTON.

A GENERAL SUMMARY OF LIVESTOCK INDUSTRIES

INTRODUCTION

The State of Washington again extends a cordial welcome to home seekers. This invitation is not only for men and women who have thus far been unsuccessful in realizing their life's ambitions, but also for those who for any reason are dissatisfied with their present surroundings and long for different environments, a change of climate, or more attractive opportunities to engage in gainful pursuits. Men who care for the rural life are especially invited, as here there are many broad acres of undeveloped lands awaiting the willing hand of the industrious. A little capital, ordinary ability, and a willingness to work can hardly fail to bring the owner ample returns and real contentment, when such forces are directed anywhere within the boundaries of this new and growing state.

Among farm enterprises that offer excellent opportunities for success today, is the raising of almost any class of livestock. Such enterprises are particularly inviting because thus far the quantity produced in the state is far below the needs of the present population. Two-thirds of our people live in the cities where no such enterprises may be engaged in, at least to any extent. Many of the others counted as rural are engaged in some branch of the lumbering industry, in mining, in fishing enterprises, and various miscellaneous occupations.

On the other hand, thousands of acres of land are lying idle, including federal lands, state lands, railroad lands, Indian lands, and private lands. Some are logged-off, some await irrigation, others are under irrigation canals, and still others await only intelligent methods of dry farming. There are all classes of soil variety, ranging from the light sandy loam of the uplands to the heavy black river bottom and the rich volcanic ash. There is not a county in the state without some agricultural land available to the settler, at reasonable prices and on easy terms. Much of it is equal to the richest in the world, while practically all is suitable for some kind of profitable growth or other. The total acreage is sufficient to supply millions of people with the necessities and comforts of life.

With a fair percentage of this land placed under cultivation no further need would exist for sending away millions of dollars in order to satisfy the demands of Washington people for animal products. This money could, instead, be distributed among Washington farms and Washington enterprises could be further financed and benefited.

PROFITABILITY

Domestic animals have always been friendly toward mankind, doing the best their breed and environment would permit. No matter what kind of treatment shown them, they have striven just the same to render the best services possible under the circumstances.

Although a certain number are necessary on the average farm, yet when it comes to making a specialty of raising them, the question of profit is certain to be the main consideration with the producer. Competition grows keener as civilization advances, so that the most favorable location must be found before anyone is willing to enter any line of industry on an extensive scale.

It has been already stated that agricultural land is to be found in every county in the state. It is also true that there is no part of the state which will not support livestock and where domestic animals will not flourish in a greater or less degree. The days of unlimited free range, to be sure, are practically over. No more do the unbridled herds of horses and fat cattle roam at will over a wide area, choosing the richest pasture wherever it exists. Now they must be confined to narrower quarters and be satisfied with less freedom than in earlier days. Such a condition, however, works a benefit to the animals themselves and the owners, for the same quantity of land is today made to support many more than formerly, in better condition and more perfect in breed.

Some of the reasons for the success of livestock of any kind may be found in those chapters of this publication devoted to the discussion of opportunities for dairying, hog raising, and poultry raising. The remainder of this chapter will relate a few leading facts in connection with the production of horses, mules, beef cattle, sheep, goats and bees.

HORSES

In relative value, horses in the State of Washington about equal all other livestock put together. According to the yearly estimate of the U. S. Department of Agriculture, there were altogether 308,000 on Washington farms, January 1, 1916, valued at $28,952,000, or an average of $94.00 per head. Unlike the ten-year period between the last two census dates, this represents no increase since 1910, for although more horses than ever have been raised, yet the demand for them has been so keen that, excepting in the case of those under three years old, the total number on hand represents not many more than what are needed to perform the work expected from them on the farms and in the cities. In fact, when we take into consideration that his competitor, the automobile, in this state, has increased in number from a few more than 3,000 in 1910 to about 50,000 at the present writing, it is certainly a wonder that the horse has held his own so well.

The favorite breeds seem to be the Percheron, the Belgian and Shires, although others mentioned by the stock raisers are the French Draft, the French Coach, the German Coach, the Hackney, the Suffolk Punch, and many mixed breeds. Good horses have sold on the market in 1915, all the way from $100.00 to $200.00, although in special cases they have gone as high as $1,500.00 per head. They are generally all sold right at home, but during the year 1915 many were shipped abroad for war purposes.

MULES

No marked increase in the number of mules has occurred during the past six years as between 1900 and 1910, but every year finds a few more than before. There are now in the neighborhood of 16,000 with a value of nearly $2,000,000.00. The leading counties are Walla Walla, Whitman, Lincoln, Adams, and Columbia. The few men from whom communications were received all declare that the demand for mules is greater than the supply. The kinds mentioned are the Black Spanish, Mammoth Jack, and Kentucky Jack. The different sections seem well adapted to their propagation and the opinion seems to be that they may be raised with less care and labor than horses,

WASHINGTON HORSES ARE IN GREAT DEMAND.

while for hard work they are considered even more serviceable. The estimated cost of raising one is from $50.00 to $100.00, while the price received in 1915 ranged from $100.00 to $250.00.

BEEF CATTLE

In nearly every part of the state beef cattle are produced. As an independent business, however, they are raised principally by eastern Washington farmers, with the largest number in the Yakima valley, the Okanogan, and the southeastern counties. In western Washington, Pierce county takes the lead, with Lewis, Snohomish, Skagit, and Whatcom also producing a considerable number each.

Very little public range may be had except in the Okanogan country and in other parts nearest the mountains. Yet, there is a vast area of other lands suitable for pasturing cattle, while much material would go to waste on grain and hay ranches were it not for this method of turning the gleanings into profit. Of course persons going into the business on a scale which would require considerable feeding and where pasture is scarce, would be compelled to take into consideration the comparative prices of feed and the market value of the beef. Two-thirds of the farmers communicated with claim that beef raising is profitable, especially as a side issue to other farm enterprises, while some consider such cattle absolutely essential to the farm. Even in the wheat section, where cattle have always received least consideration, it is as M. S. Littlebridge of Prosser says: "If every farmer that raises wheat, had cattle to eat up the straw that goes to waste, their cattle would be clear profit." Where dairy stock is used, of course, the same purpose would be achieved.

Practically all beef raised is sold in the State of Washington, no marketing place without the state being mentioned except Lewiston, Idaho, and Portland, Oregon, both of which are located right on the Washington line, and so for practical purposes, belong as much to the State of Washington as to any other state. With one or two exceptions, all those reporting say that they have never experienced trouble in disposing of the stock. These statements are borne out by the fact that there was imported into the state during the last year, about $4,-

000,000 worth of beef cattle and dressed beef. To supply even the amount consumed each year in the State of Washington, it would be necessary to kill off at least two-thirds of all the stock cattle in the state, including yearlings, two-year olds and three or over.

The cost of raising beef depends somewhat on how one stocks his farm. This cost becomes much greater, of course, if, instead of raising all feed consumed, it is necessary to purchase considerable. Estimates for the cost of producing vary from 2½c to 6c per pound dressed, or from $15 to $45 per head alive. Among the breeds mentioned are Shorthorns, Durhams, Holsteins, Herefords, the Aberdeen Angus, and various mixed breeds.

SHEEP

Many fortunes have been made in the past from sheep, and money is still being made from them. Since the largest part of the ranges are now utilized by those already in the business, it will be necessary for beginners to raise them on private lands and probably in smaller flocks. They are considered profitable by most of the sheep producers, especially now that wool is at a premium in the markets of the world. One enthusiast in the country north of Wenatchee says: "I look upon the sheep industry as one of the most profitable and interesting resources adopted in this locality, both as a specialty or side issue on a regular ranch. The returns from the wool will cover all maintenance fees of the stock and the hides will bring from 75c to $2.00 each. Mutton sheep or fat lambs in summer bring from $3.75 to $4.50, either Seattle or Spokane markets. Wethers bring from $4.00 to $5.00. This is for range sheep. Only recently have the ranchers become aware of the enormous profits and adopted sheep raising as a side issue." Others speak of the help that sheep are as land clearers, some persons claiming to keep them entirely for eating the sprouts off the stumps, which service makes it easier to get rid of the stumps entirely in a few years.

Sheep raising is not all a life of ease, however, nor always a source of easy money. Those new at the business are advised by veterans to first work with sheep a couple of years as it is a

line one can never know too much about. "The man that gets out and lives with the sheep and dies there if necessary is the one that wins."

According to estimates of the U. S. Department of Agriculture, there were about 568,000 sheep in Washington at the beginning of the year 1916. With an average value of $5.30 the total was estimated to be worth $3,010,000.00, which represents a gradual increase during the past 6 years, both in number and in value per head.

In 1914, 455,000 fleeces produced 3,638,000 pounds of wool or an average of 8 pounds each, a weight unsurpassed by any

ANGORA GOATS FORAGING IN THE KITTITAS VALLEY.

other state in the Union. The average per fleece has been, for previous years, about 9 pounds, a higher average than for any other state. The counties leading in their production at present are Yakima, Benton, Kittitas, Klickitat, Grant, Franklin, Walla Walla, and the other southeastern counties.

GOATS

"The poor man's friend" is the title one person applies to the goat. Whether this be so or not, there are many people who raise them in this state, principally the Angora breed, but also the Toggenburgs, Saanens, and others. They are raised chiefly in the counties of western Washington, especially Clarke, Lewis,

Pierce, and Thurston, although they will do well almost anywhere in the state. Nearly all persons raising them seem well satisfied as to their value, particularly as land clearers and soil fertilizers. Some persons claim to keep them entirely on account of these two attributes, and a few claim that a small number should be kept, if for nothing more than for the favorable influence they have on the health of the horses.

In western Washington, on the logged-off area, they are particularly valuable. They will eat all the low branches off the brush, then stand on their hind feet, put their front feet on the bushes and bend them down. They eat elder, alder, vine maple, salmon berry brush, grease wood, hazel brush, wild roses, huckleberry, buck berry, and willow. On the prairies of eastern Washington they will keep the weeds cleaned out, especially china lettuce, Jim Hill mustard, and Russian thistle. When the snow is on the ground, they will eat round the straw stacks and pick up around the barns. A. A. Pierpont of Baird says, "that any farmer who is raising stock will find it advisable to keep a small herd of goats along with them for they can be raised and fed without any additional expense."

Their fleece weighs between 3 and 4 pounds and in 1915 fetched about 30c a pound. The skins are worth from 25c to $1.00. The flesh of kids and yearlings make excellent meat, preferred by some to mutton. For milking, it seems that the Swiss breeds are best. E. R. Bull of North Bend claims that his give from two to four quarts of milk per day, containing from 6 to 7% of butter fat.

BEES

It is not necessary to dwell on the advantages of bee culture. It forms an excellent side proposition for the average farmer, especially such as have orchards, for besides the profits accruing from the sale of honey, the bee is considered a great benefactor in pollenizing the blossom. There are, all told, nearly 300,000 acres of orchards in the state besides about 800,000 acres of hay, a large portion of which is alfalfa or clover, unsurpassed for bee pasture. Supplementing these are myriads of honeyed flowers fringing the stumps, dotting the prairies, or beautifying the sunny hillsides.

SHEEP SUMMERING ON WEED PASTURE AND RETURNING IN AUTUMN TO THE VALLEYS.

DAIRYING IN THE STATE OF WASHINGTON

GENERAL DEVELOPMENT

GREAT INTEREST SHOWN

Perhaps no agricultural subject has of late years commanded greater attention in the State of Washington than dairying, and it is certainly true that today more thought is being given to this than to any other line of farming. Not only the farmer himself, but the business man, the professional man, the colleges, the schools, the federal government, the state, the counties, the cities, and the railroads, have all, as it were, united in one common effort to advance the dairying industry, realizing that there is no prosperity for anyone unless the farmer is successful, and that he is most prosperous when engaging in those industries that insure him the largest and most certain returns for his labor and tend at the same time to enrich the soil, rather than to rob it of its essential elements.

As a result of such a formidable array of influences, much development has taken place, but far short of the needs of the people and the possibilities which the natural advantages of the state promise. Undoubtedly the interest now being manifested and the painstaking investigations being made by many engaged in the work will exert a decided influence towards adding impetus to its further advancement.

CENSUS FIGURES

The latest United States census, taken in 1910, reported 186,233 dairy cows, all told, in the State of Washington. These were valued at $7,988,133. In 1900, according to the census, there were 107,232 cows valued at $4,076,189. These figures represent an increase for the decade of 73% in number of cows and 96% in total valuation, the latter increasing about one and a third times as fast as the quantity.

The number has gradually increased during the past six years, according to estimates of the U. S. Census Bureau, until we are credited January 1, 1916, with 263,000 head, whose total value is given as $15,912,000. This represents a numerical

increase over six years ago of about 77,000, or 41 and 4-10%, and an advance in value of $7,924,000, or nearly 100%. During this period, if the estimates are correct, the value of our dairy cows has increased two and a half times as fast as the number, while the value per head has grown from $42.00 in 1910 to $60.50 in 1916, an increase of nearly 50%.

LEADING COUNTIES

The ten leading counties in point of number, according to the reports of the county assessors, are King, Snohomish, Whatcom, Spokane, Lewis, Clarke, Yakima, Whitman, Skagit, and Thurston. These probably contain more than half the milch cows in the state, although in dairy manufactures Pierce ranks as one of the leading counties, as does also Clallam, Kittitas, Jefferson, and Grays Harbor.

SCIENTIFIC DEVELOPMENT

Number and value alone, however, do not indicate the extent of development from a scientific or commercial standpoint. This phase of the work is better exemplified by the general improvement in the herds, more approved methods of feeding, and the resulting increase in average profit per cow, besides the attention given to coordinated industries. Several sections, although of minor importance as far as number is concerned, are unsurpassed when it comes to comparing their up-to-date methods with the more careless procedure in other parts. Those who are taking the business most seriously are thoroughly testing each member of the herd, gradually weeding out the "boarders," feeding a carefully planned, well balanced ration and utilizing all side products.

These improved conditions are not confined to the largest dairies, but the small dairymen, as well, are taking hold of the industry with seriousness. More attention is given to sanitary conditions, more thought directed toward the purebred herd, the value of the silo is being gradually recognized, and the necessary crops to go with it are being raised.

BETTER BUILDINGS

Better and more sanitary buildings are being constructed, varying from the humble wooden barns of the small dairyman

to the large and imposing structures of most modern design, several being unsurpassed by anything in the west for completeness and modern conveniences. Although it is not necessary nor advisable for the average farmer to expend for his buildings, sums of money out of proportion to his capital, yet the presence of these more expensive outlays indicates the confidence many now have in this as a dairying state.

A TYPICAL EXAMPLE

A typical example of such progress is the herd of the Orton Dairy Farm at Sumner, in Pierce county. Very careful records of this herd have been kept for thirteen years. The gradual increase in the average milk yield per cow is indicated by the following figures taken in midwinter of each year. They are given not as representing anything big but for showing what is being done by many dairymen in this state who are paying more attention to the essentials of the business.

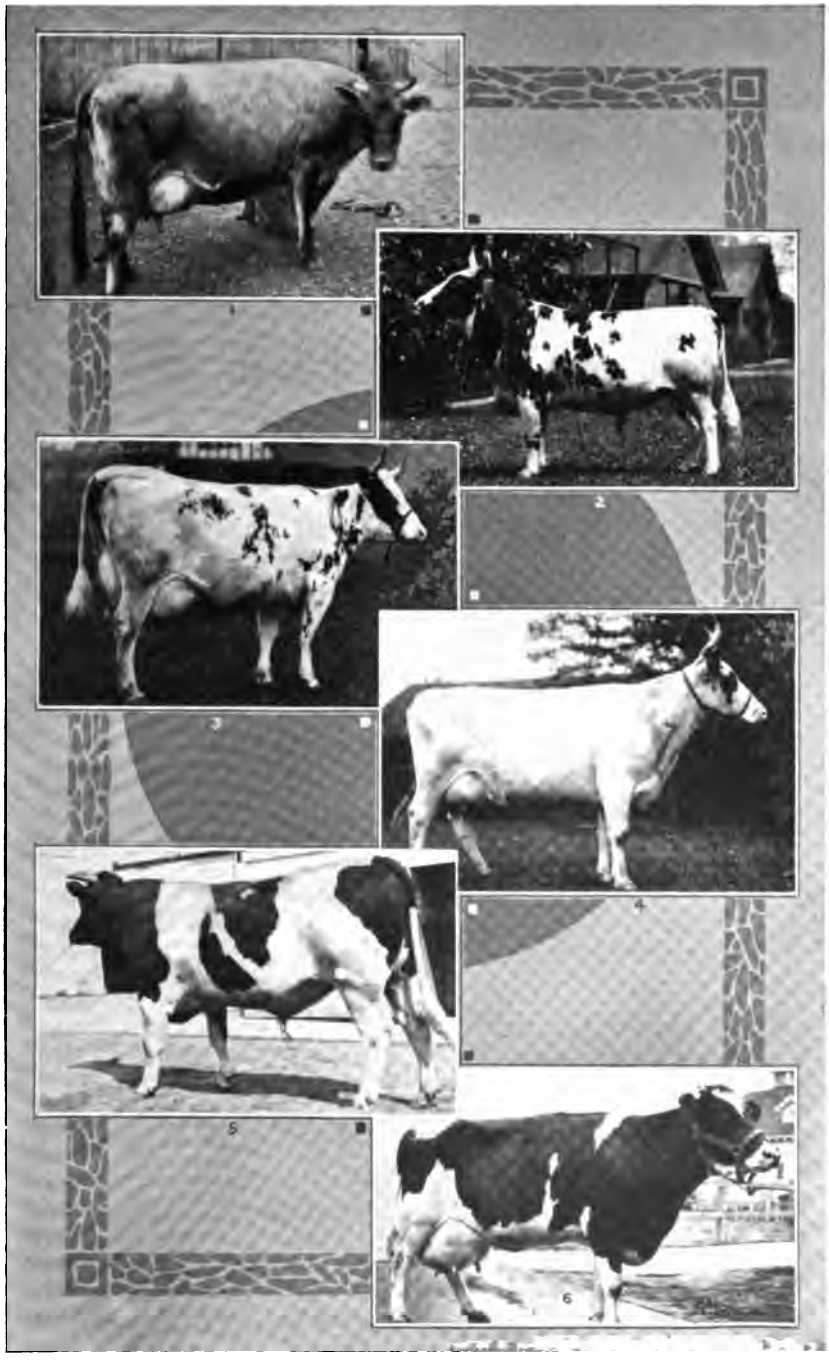
Date.	*Average milk production per cow.*	*Date.*	*Average milk production per cow.*
January 1, 1904	11 lbs.	December 31, 1910	22 lbs.
December 31, 1904	16 lbs.	December 31, 1911	26 lbs.
December 31, 1905	15 lbs.	December 31, 1912....25 cows	27 lbs.
December 31, 1906	18 lbs.	December 31, 1913....23 cows	30 lbs.
December 31, 1907	20 lbs.	December 31, 1914....26 cows	31 lbs.
December 31, 1908	21 lbs.	December 31, 1915....27 cows	28 lbs.
December 31, 1909	25 lbs.		

WORLD RECORDS

Such scientific and business like methods have led to the winning of many laurels by Washington breeders. A number of their cows have made world records in certain spheres. "Marjie Newman," a Holstein cow owned by Chas. Eldridge, Chimacum, earned the world record for the largest quantity of milk produced in one day. The following figures show her work for an entire month:

136.5	pounds milk in	1 day
895.6	pounds milk in	7 consecutive days
3,555.1	pounds milk in	30 consecutive days
5.22	pounds butter in	1 day
33	pounds butter in	7 consecutive days
132	pounds butter in	30 consecutive days

In purebred Ayrshire dairy stock, J. W. Clise of Redmond probably leads the world. He has one cow, "Lilly of Willow-



FAMOUS DAIRY STOCK OF WASHINGTON BREEDERS.

No. 1, Olympia's Fern, 252,060; No. 2, Peter Pan, 12,971 (Undefeated grand champion of Great Britain and America); No. 3, Lilly of Willowmoor, 22,269; No. 4, Willowmoor Etta 3rd, 35,833; No. 5, Hollywood Lelith Palmyra, 118,678; No. 6, Pieterje Floa Artis, 114,334. No. 2 owned by J. W. Clise; Nos. 5 and 6 owned by Hollywood Farm. See page 20 for descriptions of 1, 3 and 4.

moor," which made a world record for production in 1912-1913 of 22,106 pounds of milk, containing 888.70 pounds of butter fat, and one in 1914-1915, for 22,596 pounds of milk, with 955.56 pounds of butter fat, thus completing a five years world record of 84,891 pounds of milk and 3,362.05 pounds of butter fat, which gave her first place as a long term cow. Another, "Willowmoor Etta 3rd" completed a world record as a junior two-year old, for producing about 16,500 pounds of milk with 660 pounds of butter fat. Two other Ayrshires owned by Mr. Clise have made world records, viz., "Netherhall Brownie 9th" for production in 1910-11 of 18,100 pounds of milk, and 820.91 pounds of butter fat, and "Gerranton Dora 2nd," in 1911-12, for production of 21,025 pounds of milk, and 804.70 pounds of butter fat.

Another world record for four-year-old Holsteins was made by a cow owned by the Munroe Company, Spokane. This cow produced 35 pounds of butter in seven days, 142 pounds of butter in 30 days, and 2,886 pounds of milk in 30 days.

John L. Smith of Spokane is another enthusiast for the Holstein and has owned a number of world's record animals, including "Hazelwood Aaggie DeKol," which at three and a quarter years of age, produced 34.89 pounds of butter in 7 days and 103 pounds of milk in one day, (previous record for three-year-olds being 3½ pounds less) and "Gerben Queen," which made a record for cows over 8 years old, producing 36.41 pounds of butter in 7 days and 134.30 pounds in 30 days; milk, 122 pounds in one day. Her stable mate "Bonnie Lassie Pauline," 5 years old, produced 33.78 pounds of butter in 7 days and 133.67 pounds in 30 days.

One of the best Jersey herds is owned by E. L. Brewer, a wide awake dairyman of Satsop, Grays Harbor county. One of his cows "Olympia Fern" earned a champion record for the highest butter yield by a four-year-old, 16,147.85 pounds of milk, 1,103.8 pounds of butter.

Many others in the state have individual cows or entire herds that have developed remarkable efficiency in milk production or percentage of butter fat, but it is impossible to mention

all that have contributed to the advancement of the industry during the past few years.

HONOR TO WASHINGTON DAIRYMEN

The State of Washington has been highly honored at various international and national dairy shows and stock shows. Although the many prizes won do not guarantee general success in any particular locality, they do indicate that a certain progress is being made and, by demonstrating the possibilities for development, have a tendency to encourage those already engaged in the work or contemplating doing so.

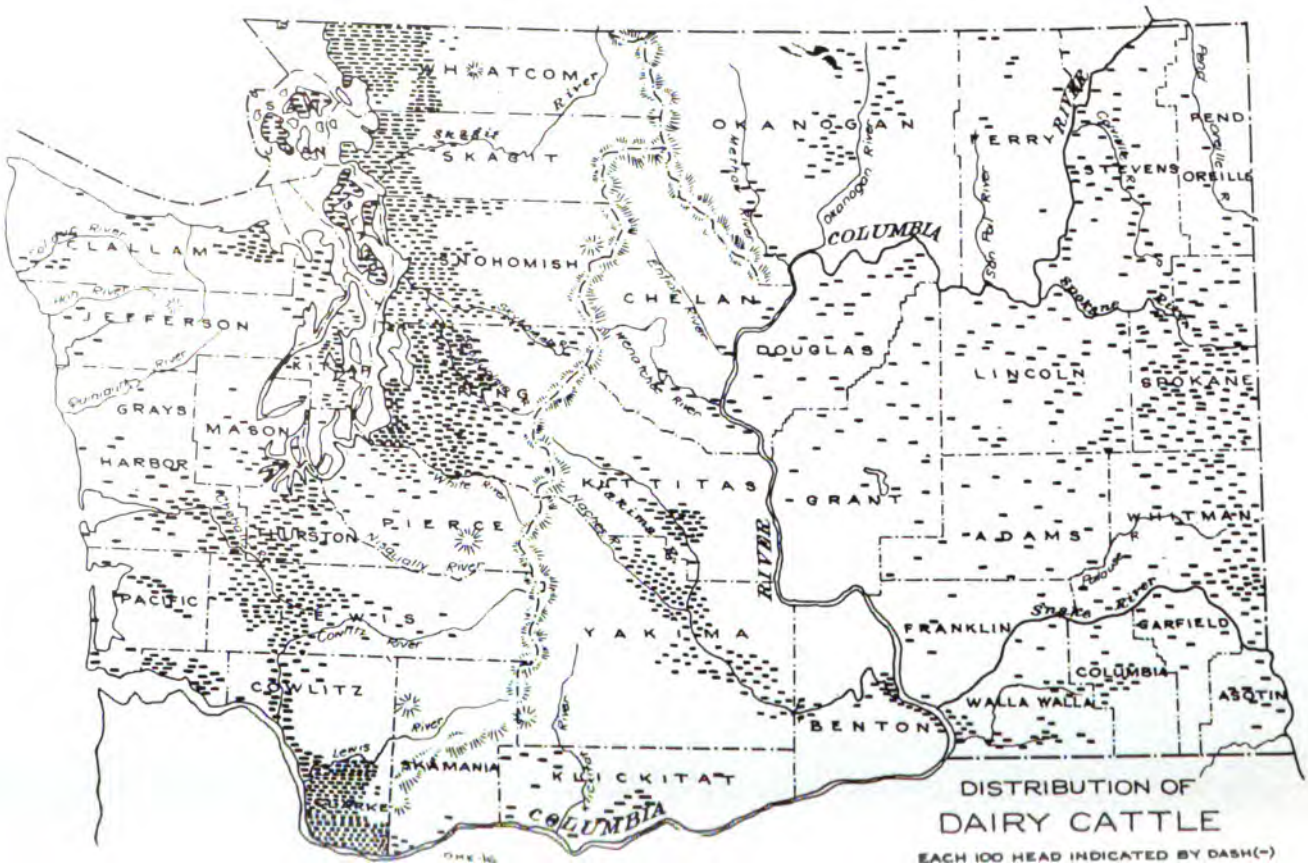
At the International Dairy Show held at Milwaukee in 1911, first prize for certified milk was won by C. W. Orton, Sumner; first prize for market milk by A. Zeeum, Thomas, and second prize for milk dealers by A. Kristoferson, Seattle. At the International Dairy Show of 1912, held in the same city, R. J. Elliott, Elliott, won second prize for market milk.

At the National Dairy Show, Chicago, 1913, first prize for market milk was won by J. Rassmussen, Seattle; first prize for certified milk by J. D. Farrell, Renton, and first prize for milk dealers' class by the Pure Milk Dairy, Seattle. At the National Dairy Show, Chicago, 1914, second prize for market milk was won by Pete Talloli, Renton.

At the Panama-Pacific International Exposition, San Francisco, 1915, first prize in the creamery class was won by the Enumclaw Creamery Company, first prize for market cream by P. O. Eckman of Enumclaw, second prize for milk dealers by the Pure Milk Dairy, Seattle, and first prize for pasteurized milk by the Hazelwood Dairy, Spokane.

PANAMA-PACIFIC INTERNATIONAL EXPOSITION

Perhaps the highest honors yet received were won for livestock exhibits at the Panama-Pacific International Exposition. The grand total of prizes won by Washington for cattle alone was 223, including four premier championships, 22 champions, 44 blue ribbons, 41 red ribbons, 33 white ribbons, 31 pink ribbons, 19 yellow ribbons, 19 green ribbons, and 10 brown ribbons. Credit should be given to some of the individuals for these honors. "It was left to one of our well known livestock breeders, J. W.


WHATCOM
SKAGIT
SNOHOMISH
CHELAN
OKANOGAN
FERRY
STEVENS
PEND OREILLE
COLUMBIA
CLALLAM
JEFFERSON
KING
DOUGLAS
LINCOLN
SPOKANE
GRAYS HARBOR
MASON
KITTITAS
GRANT
ADAMS
WHITMAN
PIERCE
THURSTON
PACIFIC
LEWIS
YAKIMA
FRANKLIN
GARFIELD
COLUMBIA
WALLA WALLA
ASOTIN
COWLITZ
BENTON
SKAMANIA
KLICKITAT
COLUMBIA
DISTRIBUTION OF
DAIRY CATTLE
EACH 100 HEAD INDICATED BY DASH(-)

Clise, of Redmond, to win the largest total of $2,795, more than half the cash awards offered in this class. Other Washington exhibitors sharing in the cash winnings were: John L. Smith, Spokane, Holstein-Friesian cattle; Carnation Stock Farm, Seattle, Holstein-Friesian cattle; D. C. Bunn, Prosser, Berkshire swine; Clark Brothers, Prosser, Berkshire swine; Albion L. Giles, Chinook, Guernsey cattle; and Wm. Bishop, Chimacum, Holstein-Friesian cattle."

Commenting upon the victories won, J. Harold Crampton, Assistant Commissioner of Horticulture and Agriculture for the State of Washington at the Panama-Pacific International Exposition, says: "But we should not lose sight of the fact that there is something more than the honor connected with those winnings; something more than the completion of a record of some well bred animal; something more than the keeping on file of an award won. The successes attained by the Washington livestock men at the Panama-Pacific International Livestock Show means that one of our industries is somewhat beyond the experimental stage, and is in that period of development that counts for recognition among the other developed industries of the state."

ADAPTABILITY OF WASHINGTON FOR DAIRYING

THE COW A FACTORY

Conducting a profitable dairy business is not just a question of whether a cow can live in any particular locality. It is a question of discovering where she will thrive and contribute the largest percentage of profit to the owner. Like a factory she turns raw material, consisting of hay, grain, roots, etc., into the refined products suitable for home consumption. The problem, therefore, resolves itself first of all into determining where this manufacturing process can be carried on with the best chance for a surplus over the cost of production. Cheap feed, large individual milk production, high percentage of butter fat, and a top notch price for butter and cream would con-

stitute the most prominent features for a dairyman's happiest dream. Although it can never be expected that he will feel absolutely satisfied with conditions anywhere, still it must be admitted that the State of Washington offers opportunities as fair as any for the full realization of his dream of bliss.

ALL PARTS OF STATE SUITABLE

Practically all parts of the state are suitable in a greater or less degree for carrying on the dairying industry, although since Washington is blessed with a greater diversity of favorable natural conditions than any other state in the Union, different homeseekers, after looking around, would soon feel preferences for different localities. These varied natural conditions are caused primarily by the unique topography of the state, which exerts an important influence in producing dissimilarities in climate, with a resulting variation in the rainfall and vegetation. Several ranges of mountains exist, the most important of which are the Cascades, separating the state into eastern and western Washington, and the Olympics, enveloping the Olympic Peninsula and overlooking the Pacific ocean. These mountainous sections give the state its most characteristic and beautiful features, besides forming repositories for storing the waters that flow in pretty streams to the valleys below, where they quench the thirst of the animal kingdom, or irrigate the fertile lands.

CLIMATE

"I consider Washington one of the best states for dairying as we have mild winters and no hot summers. We have cows in the yearly test and find they do better than most other states," says John Van Trojen, Jr., manager of the Wm. Bishop farm, Chimacum, one of the largest dairy farms in the state. Practically the same remark is made by Geo. F. Trott, a prominent dairyman, in the White River valley: "Before I came to Washington, I tried dairying in the state of Maine. I found the winters too long. We could not keep enough cows to fertilze our worn out soil so that we could raise our own feed, and boughten feeds were too expensive to feed." From the country north of Spokane, come the following words by a prominent creamery

man: "The climate is also favorable, not being subject to any great extremes in heat or cold. With moderately high altitude, the health of the cows is always good, the water is always good, and there is no factor to prevent any progressive dairyman from succeeding and succeeding wonderfully." Swift and Company, Seattle, say: "We believe the State of Washington in time to come will be one of the greatest dairy states in the Union, due mostly to natural causes, climate, pastures, etc." A representative of the Bradner Company, Seattle, says: "There is not a state in the Union more favorably adapted to dairying than this, especially on the west side. Our climate is ideal for dairying, never very hot or cold, and the pasturage is good longer than any other state that we know of." D. R. Stockley, Cove, King county, who keeps Guernsey cows as a side issue to poultry and truck farming, says: "Over New York, Wisconsin, and Illinois, my former places of residence, Washington offers a more equable climate, better markets, and a more responsive soil."

These favorable conditions are caused by the mountains and warm ocean currents, guaranteeing as they do, almost absolute freedom from extremes in temperature and violent atmospheric changes, like those that in many places cause great loss and suffering. There are really no severe winters in any part of the state and most parts are remarkably fortunate for their moderate climatic conditions. The cows may be turned into the fields almost any day so that throughout the year the benefits of sufficient exercise and fresh air may be enjoyed. This is especially important to men who have considerable pasture land, giving them every chance to utilize the natural growth of forage which might otherwise go to waste.

The annual normal temperature for western Washington, as deduced from a long period of years, is about 51 degrees, for the country in the vicinity of Spokane about 48 degrees, and near Walla Walla 53 degrees. The lowest monthly normal for the same period in the vicinity of Seattle is 39 degrees, near Spokane 27 degrees, and Walla Walla 33 degrees. The highest monthly normal near Seattle is 64 degrees, Spokane 69 degrees, Walla Walla 74 degrees.

CARROTS WILL YIELD AS HIGH AS 60 TONS TO THE ACRE ON LOWLANDS.

TEMPERATURE AND PRECIPITATION IN SOME LOCALITIES FOR YEAR 1915

Town	*Mean Temperature*			*Precipitation*
	Lowest Monthly	*Highest Monthly*	*Annual*	
Aberdeen	38.8	62.2	50.4	75.68
Bellingham	39.4	64.2	51.4	32.48
Olympia	38.6	66.4	52.2	52.27
Seattle	40.6	66.8	52.8	33.83
Tacoma	39.0	66.6	52.3	39.85
Vancouver	37.2	70.0	53.6	40.66
Wenatchee	22.2	78.1	50.6	13.81
North Yakima	24.6	73.8	51.0	10.43
Spokane	26.2	75.2	49.9	16.36
Walla Walla	30.8	79.3	54.8	17.08
Ellensburg	20.4	72.2	47.4	13.26

SOILS

There are so many different varieties of soil in the state that it would be difficult to describe each one with the amount of space available. The State College, however, has published bulletins on this subject, which may be secured by any one upon application to the director of the Experiment Station at Pullman. What interests most men is whether a varied vegetation suitable for the well balanced ration of domestic animals can be produced in sufficient abundance. That this is true can best be proved by a few statements by experts in the work.

VEGETATION IN WESTERN WASHINGTON

Prof. H. W. Sparks, formerly superintendent of the Department of Farm Demonstration of the Washington State College, says:

"We believe there are few, if any, places in all our land that offer as many inducements to the home-builder as parts of western Washington, possessing as it does a climate and soil that produces wonderful results. We have measured and weighed twenty-seven and eight-tenths tons of the best quality of forage crops for the dairy cow per acre. We have seen three crops from the same land in one season, two of vetch and grain followed by corn that matured sufficiently for excellent feed."

No one can speak with greater authority regarding the kind of crops adaptable and the quantity of each that can be produced to the acre, than Professor E. B. Stookey, agronomist for the State College at the Western Washington Experiment Station, located at Puyallup, where ample opportunity is afforded

for experimenting with both upland soil and low lands. Among the crops that grow well in western Washington, he mentions oats, barley, wheat, rye, peas, vetch, beans, corn, kale, marrow cabbage, mangles, sugar beets, swedes, turnips, carrots, red and alsike and white clover, alfalfa, sweet clover, crimson clover, espersette, and seradella. Among grasses well adapted to our conditions, he mentions Italian rye grass, meadow fescue, timothy, orchard grass, Kentucky blue grass, red top and bent, besides a number of others that do well although not to such a degree as those mentioned. Experiments carried on at the station under his supervision, indicate the following as average crops per acre for some of the more common forage plants, although many farmers report much higher yields.

Oats	Upland	60 bu.
Oats	Lowland	100 bu.
Barley	Lowland	40 to 80 bu.
Wheat	Upland	25 to 30 bu.
Wheat	Lowland	40 to 60 bu.
Peas	Upland	30 to 50 bu.
Peas	Lowland	60 to 80 bu.
Oats and Vetch	Upland	(Fall seeded, green weight, for silage). 7 to 10 tons
Oats and Vetch	Lowland.	(estimated) up to 20 tons
Kale	Lowland	25 to 35 tons
Mangles	Lowland	30 to 50 tons
Mangles	Upland	7 to 15 tons
Field corn	Upland	less than 5 tons
Field corn	Lowland	7 to 15 tons
Clover and grass mixtures.	Upland	1st cutting, 3 to over 4 tons; 2nd cutting 1 ton
Carrots	Lowland	15 to 25 tons
Carrots	Upland	10 to 20 tons

J. W. Miller, Burlington, Skagit county, who keeps 37 cows, says among other convincing remarks: "Two years ago we put up a silo which is the most essential thing on a farm. * * * We planted corn to fill our silo, thinking we might get some immature corn to fill our silo, not expecting such as we attained. This patch of corn by measurement in the field went in foliage and corn 80½ tons to the acre, which is more feed than was ever raised of anything on an acre of land in the known world. There are place in California where they claim to raise 50 or 60 tons of cactuses to the acre. They also claim they have raised as high as 70 tons of corn to the acre in Virginia. But at this we have them beat. All other states and east of the mountains they claim

that 15 to 25 tons is a large crop. Now this corn got thoroughly ripe the first of September, which is going some for a country that claims to be no corn state. We harvested 500 bushels of corn. We also sent this year 125 stalks of corn to the National Corn Show at St. Paul and it was the tallest and largest that they had ever seen."

EASTERN WASHINGTON VEGETATION

The counties of eastern Washington are favored with conditions that permit a wide range of crop production. The irrigated regions enjoy the greatest variation in this respect and with few exceptions produce the largest yields of cereals, roots, and grasses, while fruits grow to perfection. The principal forage crop grown is alfalfa, although corn is getting to be grown more extensively as the farmers become convinced that the conditions favor its production. Alfalfa will yield from 3 to 8 tons per acre, with occasionally even higher yields. It is known as one of the best all round forage plants in existence, is a good milk producer and causes more rapid growth in cattle than anything in eastern states. Corn will yield from 25 to 100 bushels per acre and under proper care will go higher. One of the boys' and girls' corn club at Prosser, made a record of 121.8 bushels of measured corn on an acre of ground; four boys of the same club averaging 116 bushels per acre. Timothy and clover will yield from 3 to 7 tons, and potatoes up to 600 bushels. Other crops yield in proportion.

NON-IRRIGATED CROPS

The dry farming sections, too, although devoted generally to wheat, except in a few places where oats and barley receive most consideration, are gradually finding other crops can be grown to advantage, including corn, sweet clover, alfalfa, vetch, and peas, wheat, rye, and oats also being raised for silage purposes. Investigations by J. R. Shinn, agriculturist of Spokane county, show that winter wheat sometimes with vetch mixed, for silage, yielded from 4 to 20 tons. W. W. Stillman, near Spokane, raised, without irrigation, 3 tons of sweet clover at the first cutting and a second crop for seed. C. S. Bennett,

Ritzville, raised 45 tons of fall rye on 2½ acres or 18 tons of silage to the acre. Henry Rosenhoff, near Ritzville, raised 14 bushels of peas on less than an acre.

E. G. Schumacher, Granger, Yakima county, says: "The land is somewhat higher priced here than in eastern Wisconsin, but we can with less acreage raise more roughage, and because of milder climate less high priced buildings are necessary and the conditions are more favorable."

J. Metzger, Boyds, Ferry county, keeps about 20 cows, including some thoroughbred Holsteins. He has a sire which is a grandson of the great Hengerveld De Kol who has 120 A. R. O. daughters and 38 proven sons. He says:

"I was induced to go into dairying and stock raising because I considered that $1,000.00 worth of feed was going to waste on my field each year, and I estimated that our county is loser by many thousands of dollars each year in feed. I now have 40 head of cattle and 8 horses. Stevens, Ferry, and Okanogan counties comprise a section of the U. S. almost unequalled for dairy opportunities."

H. Bakenhus, Rocklyn, Lincoln county, has been a dairyman for 31 years, 10 of which were in Washington. Regarding the advantages of the State of Washington for dairying, he says "climate is milder, winter is shorter, land is cheaper, and we always get good prices for all our products."

"It is the best and surest thing out, for a farmer with small capital, and there is so much feed going to waste on the wheat farms in Washington which would bring the farmers, if they cure all of it, hundreds of thousands of dollars. I have been talking dairying to people for so long, and not only that, but I have started some of the people and sold them cows (on time) and it seems they are all satisfied. As soon as these homesteaders, many of whom come from the city, get two little horses and about 6 cows, break up the good land that lies in spots around the scrub land, they are all right and feel happy."

The above illustrations are given not as exceptions but as concrete examples of the general adaptability of the different parts of the state. The final success in any case must depend on how the dairyman manipulates these many advantages.

VETCH GROWN FOR SILAGE, IN THE SPOKANE COUNTRY.

MARKETS AND TRANSPORTATION

DEVELOPING THE MARKET

It is, of course, needless to assert that an abundance of crops does not of itself guarantee a profit to the producer, unless a ready and sufficient market exists for the surplus, together with cheap transportation facilities. To a certain extent, this market can be created, or at least extended, if the producer will strive for the best grade of products and unite with his fellows in all laudable efforts to compel recognition of the surpassing merits of his goods on the part of the dealer and consumer. With such a spirit prevailing, a paying market can usually be found for the products of any community. Nevertheless, it is gratifying to be pursuing one's vocation in a section where the natural conditions for building up a good market are most favorable.

WASHINGTON IDEALLY LOCATED

One of the greatest advantages for developing a market is a large and rapidly growing city population within the immediate vicinity of the producer, also easy communication with other countries or states that depend on outside sources to satisfy their own needs.

These conditions exist for the State of Washington, which led all the states in the Union, in per cent. of increase in population between 1900 and 1910, and is still growing at a rapid rate. In 1900, its population was 518,105; in 1910. it had grown to 1,141,100, and the U. S. Census Bureau estimate at the present time places it at about 1,500,000. About two-thirds are probably in the cities. In addition, the city of Portland with a population of about 300,000 just across the Columbia river, in Oregon, draws on the southwestern and southern counties for a large part of its needs. To the north, the city of Vancouver, with over 200,000, and Victoria with 32,000, both Canadian cities, draw their supplies as much from the State of Washington as from their own dominions.

ALASKA TRADE

Still further north is the vast territory of Alaska, whose development is just beginning. Its main endeavors being directed toward mining and fishing and the obtaining of furs and seals, it must always depend more or less on the rest of the world for dairy products, which can be produced so much more economically in a section especially adapted for those enterprises. Further development of this vast territory must certainly mean ever increasing shipments of dairy, poultry, and meat products, and Washington is certain to get the most of this trade on account of being the nearest territory where these things can be produced to the best advantage. During the year 1915, butter valued at $441,224 was shipped from Washington to Alaska; cheese worth $53,509 was shipped, and condensed milk to the value of $372,977.

QUANTITIES IMPORTED

Until quite recently it has been necessary to ship from $5,000,000 to $10,000,000 of dairy products from states further east in order to satisfy the needs of our own people and supply as well these other sections. Although the amount shipped in is much less now, still the total value runs into thousands of dollars, the quantity shipped by five firms alone, during the year 1915, amounting to about $400,000. About $150,000 of this was for cheese, much of which was imported from Italy, France and other European countries, besides some from the Mississippi states. Altogether probably about 75% of the cheese marketed in Washington is shipped from outside.

HOW FARMERS DISPOSE OF THEIR PRODUCTS

Most of the dairymen separate the cream and sell to the creameries, who send their wagons after it; others sell to the merchants, a very few going to the trouble of peddling it around. The skim milk is then usually fed to the hogs. Many sell the whole milk to the condenseries or the city retailers. Very few of the farmers report any difficulty in disposing of the products, while the majority of the creameries reporting claim that they have difficulty in getting enough, a few being forced out of business each year on this account.

DAIRY MANUFACTURES

There are about 186 creameries at present, forty of which are located in eastern Washington and the others on the west side. The total amount of butter fat used by all these during the year, June 30th, 1914, to July 1st, 1915, was 15,020,536 pounds, which was manufactured into 18,484,255 pounds of butter, valued at $5,668,434.00. In addition, during the same period, 969,058 gallons of cream were shipped into Oregon and manufactured there into butter valued at $899,286. Altogether more than six and a half million dollars worth of butter was manufactured out of Washington cream during the 12 months mentioned.

There are thirteen condenseries located as follows: Two at Mount Vernon, and one each at Auburn, Issaquah, Ferndale, Seattle, Kent, Chehalis, Everson, Stanwood, Sedro Woolley, Monroe and Snohomish. For the year ending July 1st, 1915, these thirteen plants used 185,795,817 pounds of whole milk and manufactured 1,926,809 cases of condensed cream valued at $5,618,151.00.

There are sixteen cheese factories; two at Chimacum, two at Menlo and the others at Arlington, Center, Woodland, Ferndale, Proebstel, Orchards, Quilcene, Bellingham, Satsop, Winlock and Frances. Altogether they manufactured 1,067,076 pounds of cheese during the year ending July 1st, 1915, valued at $187,-477.00.

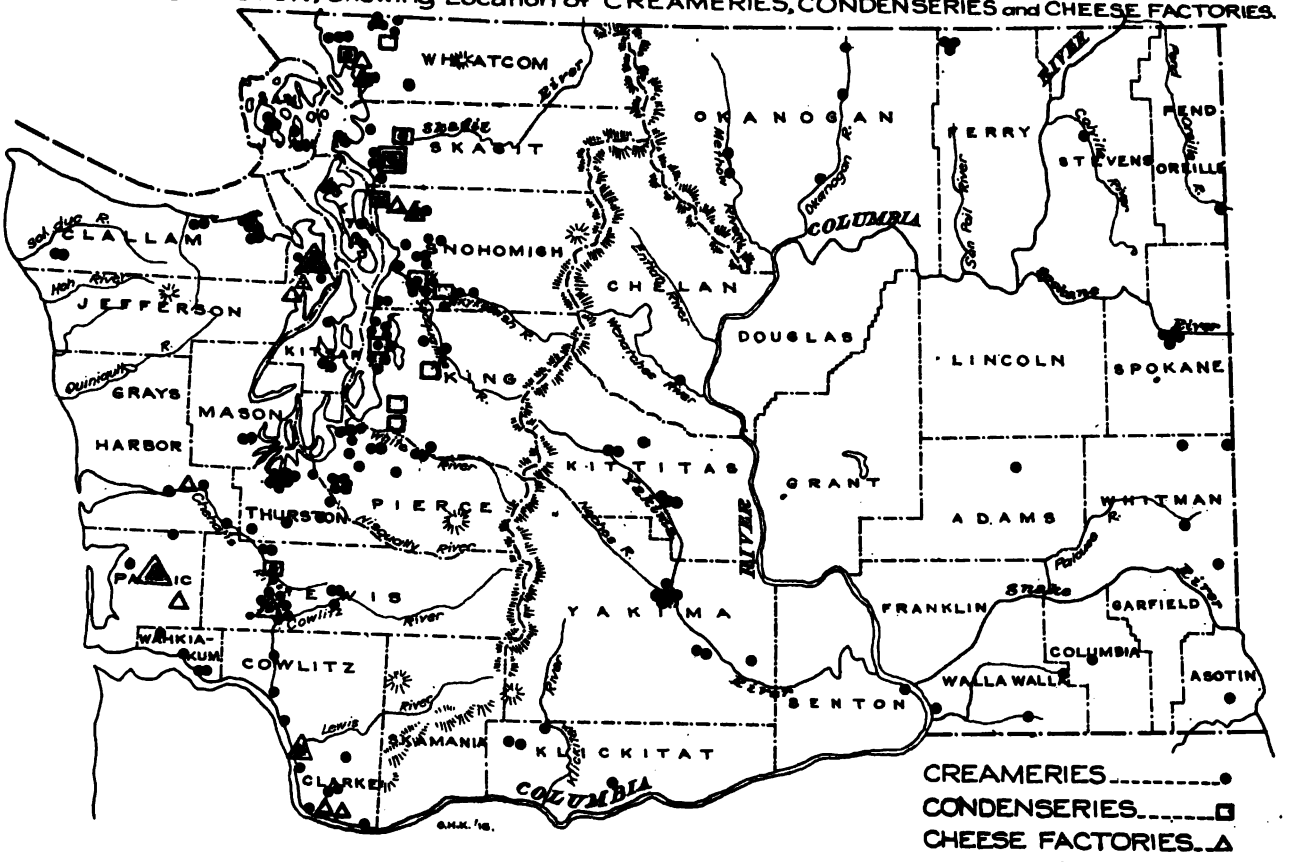
CITY CONSUMPTION

In addition there were sold in the cities 10,306,348 gallons of whole milk valued at $3,425,970.00, and 683,784 gallons of cream valued at $979,519.00, while milk and cream valued at $3,377,904.00 was exported into Oregon. These figures, with the others, represent a total output of dairy products by the State of Washington during the period from June 30th, 1914, to July 1st, 1915, of $20,156,640.00.

TRANSPORTATION FACILITIES

Successful marketing is closely linked with satisfactory means of transportation. Four main lines of transcontinental railroad companies enter the state over their own tracks and

MAP OF WASHINGTON, Showing Location of CREAMERIES, CONDENSERIES and CHEESE FACTORIES.



several render service over the roads of others. About 6,000 miles of steam railroad, including branch lines into nearly every fertile valley which has experienced any considerable development, make daily service possible for practically every city and town on the mainland. There are also about 1,000 miles of electric railroad, much of which serves the rural sections with hourly trains. Many of the individual farmers own automobiles, and since there are 50,000 miles of good roads permeating the state and reaching every farm house, he experiences no inconvenience in reaching a railroad station or, if he so desires, of driving direct to any city in the state.

An added advantage for cheap transportation consists of the 1,200 miles of navigable river and 2,500 miles of salt water front, with some of the best harbors in the world. Steamers from all parts of the world enter these ports and connect us with Alaska, Canada, California, South America and "the Orient," while the opening of the Panama canal gives direct water communication with the Atlantic seaboard and European ports.

VALUABLE HELPS

As a result of the positive desire already noted on the part of the people in general to see the dairyman always prosperous and contented, a number of substantial means of aiding him have been devised. Such help is seldom in the form of money but it is nevertheless just as valuable and just as necessary, and is rendered wholeheartedly and impartially.

STATE DEPARTMENT OF AGRICULTURE

Several deputy dairy experts are employed by the Department of Agriculture, part of whose duties it is to advise and assist the dairymen of the state in pursuing the most advanced methods in carrying on the work. Every dairy farm in the state is visited as often as possible and suggestions given wherever needed or requested. While at the dairy farms, talks are had with the proprietor and with the wife and children, if possible, on any subject desired, relative to the dairying industry.

The talks given, cover feeding and breeding of cattle, sanitary conditions, construction of buildings, condition of employees, care and condition of utensils, handling of milk and cream until it reaches the customer, and all other matters connected with the economical production of a sanitary and pure dairy product. In his last biennial report the deputy state dairy inspector says:

"Besides visiting the dairy farms and inspecting the milk supplies of the various cities of their districts, the inspectors must inspect all creameries and cheese factories. In the latter the purpose is to promote progress. Conditions of equipment and the new product are noted. The methods of testing are observed, and wherever and whenever possible the inspector is directed to offer suggestions and assistance in order that, in addition to being an officer empowered to enforce the law, he may at the same time be an instructor spreading knowledge and information, thereby making him a valuable and much sought after individual to those engaged in the various phases of the dairy industry."

STATE INSTITUTIONS

The State College, at Pullman, whose function is principally agricultural, maintains a special dairy department, giving complete courses in all branches of the dairy industry. This work like all other departments of instruction in that institution, is paid for out of state appropriations and is free to all residents of the State of Washington. For the benefit of those who cannot attend the college, farmers' institutes are held at regular intervals in all the agricultural sections of the state. Individual help is also rendered to any person or organization making their wishes known.

Two important experiment stations are maintained, one at Pullman, where a farm of 416 acres is worked, and another at Puyallup, where a farm of 60 acres is used. The results of all experiments are usually published in pamphlet form and mailed free to those requesting them. Any person may also send samples of soil and get them analyzed. Such other advice or general assistance as can be given through the mail is gladly given, and a representative of the college will visit any particular farm for personal suggestions if possible to do so.

AGRICULTURAL AGENTS

Working in conjunction with the State College and under its general supervision are county agriculturists employed in a

CORN GROWN FOR SILAGE IN THE PALOUSE COUNTRY—NON-IRRIGATED LAND.

number of counties. These men are agricultural experts of practical experience, and devote all their energies toward helping the farmer in their own particular counties. At present, thirteen counties have taken advantage of the law authorizing their appointment, and the probabilities are that the others will in time be served in like manner. The counties now employing them are: Wahkiakum, Benton, Adams, Spokane, Walla Walla, Douglas, Okanogan, King, Grant, Grays Harbor, Clallam, and Jefferson.

COW TESTING ASSOCIATIONS

Farmers have been slow in forming cow testing associations, but with the help of a special agent of the Dairy Extension Division of the United States Department of Agriculture, the popularity of such organizations is rapidly growing, and causing the dairymen who belong to take double interest in watching the work of each individual cow and noting the differences between the income producers and the unprofitable ones. At the present writing there are already eleven such associations, representing about 6,500 cows. These are as follows: The Whitman County, Walla Walla, Enumclaw, Montesano, Duval, Chehalis, Puyallup Valley, Snohomish Valley, Skagit Valley, Lynden, and Thurston County Cow Testing Associations. In addition to these, a number of others are being formed and will undoubtedly organize very soon.

FAIRS

The value of agricultural fairs has long been recognized in the state, so that every locality is now served each year by one or more. Almost every county has one, either by itself or in conjunction with others. In addition, the State Fair is held at North Yakima, the Spokane Interstate Fair at Spokane, the Columbia River Interstate Fair at Vancouver, Wash., the Southwest Washington Fair between Chehalis and Centralia, the Western National Dairy Show at Seattle, and the Cascade International Livestock Show at North Yakima, besides similar fairs at cities just outside the State of Washington. Suitable prizes are offered and many other familiar ways of encouraging the stock raiser are always in evidence.

STATE DAIRYMEN'S ASSOCIATION

Another organization of acknowledged helpfulness is the State Dairymen's Association, which meets once each year to discuss matters pertaining to the entire field of this industry. Practical talks are given by local men actively engaged in the work, the State College professors, the state agricultural commissioner or his deputies, representatives of the United States Department of Agriculture, besides others interested directly or indirectly in animal industries. The officers and various committees make it their principal aim to champion the cause of progressive dairying. The proceedings of each meeting are embodied in verbatim reports, published soon after adjournment, and distributed free to members.

PRIVATE ENCOURAGEMENTS

In addition to the above mentioned specific modes of encouraging the dairymen, financial assistance is often rendered, especially where the farmer has shown himself worthy of confidence. This is done by the local bank, the creamery, or an organization of public spirited business men. Fay F. Dean, Newport, Pend Oreille county, says: "Our local banks will finance any responsible farmer for any number of cows that he can feed and take care of properly." "Our banks are willing to loan money to the dairymen on very liberal terms," says W. C Sohns of the Pine Creek Dairy Co., Spokane. The same is being done in other sections as well. Lately at Grays Harbor, a readiness has been indicated on the part of one of the banks to put aside a certain amount of money to aid in the building of silos. In Pierce county, the Rotary Club, an organization of business men, has started similar work on a larger scale than anything of the kind yet contemplated in the state, extending their operations into Thurston and Lewis counties. Any responsible person, who has land either by ownership or lease, can secure as many high grade cows as he can properly take care of. These cows are chosen by an expert from the experiment station and the farmer is given ample time to pay for them out of the sale of dairy products.

These are just a few of the ways in which the dairying industry is being encouraged in the State of Washington, but

they help to prove the generous spirit of helpfulness which prevails, manifesting itself on every propitious occasion for the benefit of those in a position to take advantage of the opportunities.

PROFITS FROM DAIRYING

DECIDING ELEMENT

The deciding element which influences most people to undertake a new industry or continue a familiar one under conditions different from what they have been accustomed to is the probability of satisfactory remuneration. Generally it must be kept carefully in mind that profitability is more or less a relative term. Many men consider they are losing money if it turns out that more might have been made at a different occupation, or should it appear that the percentage of profit would have been higher by selling the crops than by feeding cows. Too many also attribute to unfavorable conditions what should have been charged against poor judgment, inaction, or gross ignorance, all of which are made still more possible by lack of bookkeeping.

COUNT ALL ITEMS

In estimating profits, all conditions or agencies that contribute anything at all either to the success or failure of the enterprise should be taken into consideration. Among the leading elements which should not be overlooked are the following: Amount of capital invested, amount of time devoted to the work, original cost of each animal, milk yield of each individual cow, market prices of feed, prices of butter fat, certainty of market, and transportation facilities. In addition, one should not forget the value of products consumed on the table, besides what is fed to the stock, length of life granted the cow and depreciation from age, cost of keeping her in health, and, above all, the advantages accruing to the soil. Some consider the last item of such prime importance that they are willing to keep a certain number of cows, even if they only break even in other respects, for they consider this the cheapest method of preserving the soil fertility. It is certainly very evident that cash receipts represent only a portion of the benefits derived.

PROPER MANAGEMENT WINS

Those who have taken pains to properly inform themselves regarding the different details of dairying, and are not afraid of the effort required, are usually successful, but the theory so long cherished by many, that it is only necessary to "keep" some cows and they will do the rest, has long since exploded. To insure a profit, care and attention must be given. Although the returns may be less some years than others, on account of disturbing factors which disarrange the affairs of the entire world, yet, on the whole and under normal conditions, dairying in Washington offers as certain and dependable a means of earning a good living as any farm enterprise that one might engage in. In some instances, where conditions are especially favorable and the management of the best, the returns may be beyond expectations.

The percentages of profits claimed by the different dairymen vary. Such variations are probably caused by the differences in local conditions and management, already noted, also in the quality of the cows. Of course, those nearest the big markets will stand a chance of getting the largest prices, since they can often dispose of the whole milk and sweet cream for immediate consumption. Whether the profits are larger would, of course, depend on the total cost of production, including interest on the higher value of the land used.

PROFITS FOR 1915

The following figures for the years 1915, presented by some of the men actually engaged in the work, are given as an indication of what can be done. Practically all acknowledge that the year 1915 was one of the poorest years in the dairying industry, a factor to be taken into consideration by those reading these reports.

Lawrence Iving, Cathlamet, Wahkiakum county, has 20 Jersey cows with 30 acres of land devoted to dairying. His income for the year was $2,100, and expenses, including $300.00 for labor, $1,360.00, making a profit over all of $740.00.

P. A. England, Port Orchard, Kitsap county, along with his chickens keeps from 7 to 10 cows on 20 acres of land, buy-

KALE ON THE LOWLANDS OF WESTERN WASHINGTON.

ing feed and selling milk. Expenses for year were $765; receipts, $1,036; profits, $271.

W. J. Payne, Ellensburg, Kittitas county, milks from 20 to 30 cows, Jersey and Holstein breeds. He farms 90 acres of land, making extensive improvements at the same time. About 75% of feed is raised on his farm.

Receipts		Expenses	
Milk (12,775 gals.)	$3,832 50	Hay (25 tons)	$200 00
Cream (730 gals.)	912 50	Ensilage (85 tons)	425 00
Fed to stock	150 00	Roots (2 tons)	10 00
Calves produced (45)	270 00	Grain (1,600 bu.)	700 00
Other receipts	500 00	Labor	500 00
		Losses	400 00
		Pasture	75 00
Total receipts	$5,665 00	Total expenses	$2,310 00
Profits for year	$3,355 00		

E. L. Brewer, Satsop, Grays Harbor county, keeps 25 Jerseys. He considers the future of dairying bright and his section of the state better adapted to dairying than any other business.

Receipts		Expenses	
Milk sold	$1,800 00	Hay (50 tons)	$500 00
Cream sold	1,922 37	Ensilage (60 tons)	300 00
Fed to stock	200 00	Roots (100 tons)	300 00
Consumed	73 00	Oats (15 tons)	400 00
Calves produced	1,500 00	Pasture	300 00
Stock sold	1,175 00	Other feed	500 00
Hogs sold	1,050 00	Labor	2,000 00
		Losses	200 00
		Other expenses	100 00
Total receipts	$7,720 37	Total expenses	$4,600 00
Total profits for year	$2,120 37		

J. C. Graham, Palouse, Whitman county, has kept better records of the dairying business than most people. He says: "I have traveled over most of the United States and Canada but I have never seen a better section for farming than the Palouse country." He raises practically all feed on his farm.

Receipts		Expenses	
Milk sold (42,000 gals.)	$8,173 40	Hay (200 tons)	$2,000 00
Cows and calves sold	2,250 00	Ensilage (150 tons)	600 00
		Roots (10 tons)	60 00
		Grain	1,800 00
		Labor	1,000 00
		Losses	300 00
		Other expenses	980 00
Total receipts	$10,423 40	Total expenses	$6,740 00
Profits	$3,683 40		

G. Van der Griend, Lyman, Whatcom county, keeps 20 Guernsey cows with 60 acres of land for dairying. He raises most of his feed. Capital invested about $28,000.

Receipts for Year		Expenses	
Cream	$1,766 38	Hay (20 tons own raising @ $15, 13 tons alfalfa @ $12)	$456 00
Fed to stock (104,455 lbs. milk @ 25c a hundred)	261 00	Roots (12 tons @ $4)	48 00
Consumed (200 lbs. butter, 3,650 gals. milk, estimated)	125 00	Grain (oats, bran, oil meal, molasses feed)	376 00
Calves produced	145 00	Pasture (20 acres permanent and meadow in fall)	160 00
Registered bull	150 00	Straw	40 00
		Labor (one hired man @ $25)	300 00
		Losses	120 00
Total receipts	$2,447 38	Total expenses	$1,500 00
Profits	$947 38		

O. H. Stevenson, Espanola, Spokane county, has spent five years as a dairyman in Washington. He keeps 40 cows and 20 head of young stock, grade and registered Holsteins. He offers no complete figures for entire herd, but gives the expenses and receipts for one cow for the month of December, 1915, which he considers a fair average.

Receipts		Cost	
Milk (1,244 lbs.)	$24 88	Breeding	$0 50
Manure (½ ton)	1 25	Labor	2 00
		Barn rent	20
		Feed	8 70
Total receipts	$26 13	Total cost	$11 40
Profit for one cow, one month	$14 73		

W. H. Illman, Sultan, Snohomish county, keeps 12 Jersey cows with 40 acres of land devoted to the industry. He raises 80% of feed on farm. He says that dairying is the only sure line for the average farmer. He also raises hogs, stock, fruits, etc. His records for the dairying show the following:

Receipts		Expenses	
Cream	$1,000 00	Hay (40 tons)	$480 00
Fed to stock	120 00	Ensilage (60 tons)	240 00
Family consumption	90 00	Roots (10 tons)	60 00
Calves raised	100 00	Pasture	200 00
Other receipts	700 00	Labor	200 00
		Other expenses	200 00
Total receipts	$2,010 00	Total expenses	$1,380 00
Profits	$630 00		

J. E. Buckingham, South Bend, Pacific county, keeps about 20 Holstein and Jersey cows as a side issue, using considerable tide land for pasture. He advises "anyone starting in the dairy business to take plenty of time in location. Build a good tight, substantial barn, get good young cows with producers behind them. I think a silo is the only system to insure a steady milk flow summer and winter, besides saving labor. Kale can be raised with great success here and fed three or four months in fall."

Receipts		Expenses	
Milk and cream	$4,500 00	Hay (alfalfa, 3 cars)	$520 00
Calves	100 00	Kale	120 00
		Straw	12 00
		Labor	2,160 00
		Losses	200 00
		Hay	300 00
Total receipts	$4,600.00	Total expenses	$3,312 00
Profits	$1,288 00		

M. M. Makiyama, Kent, King county, has 45 cows. He says: "I experienced considerable loss in income as compared with a normal year, because the price of milk was very low."

Receipts		Expenses	
Milk	$5,500 00	Hay (110 tons)	$1,220 00
Calves	250 00	Pasture	1,000 00
		Other feed	1,000 00
		Labor	720 00
		Losses	450 00
		Other expenses	600 00
Total receipts	$5,750 00	Total expenses	$4,990 00
Profits	$751 00		

B. R. Richter, Trout Lake, Klickitat county, 24 miles from a station, keeps 15 cows together with some hogs, shipping products to Portland, Oregon. He considers that the dairying industry is limited only by the earning capacity of the people, who cannot buy if out of work. His farm accounts for the year are as follows:

Receipts		Expenses	
Grain sold	$850 00	Hay (100 tons)	$1,000 00
Cream sold	1,150 00	Carrots (20 tons)	100 00
Fed to stock, skim milk	300 00	Oats (5 tons)	125 00
Consumed	150 00	Uncleared land used for for pasture.	
Calves (12)	360 00	Labor (not hired)	500 00
Other receipts (20 hogs)	300 00		
Percheron colt	100 00		
Total receipts	$3,210 00	Total expenses	$1,725 00
Profits	$1,485 00		

CUTTING ALFALFA ON EASTERN WASHINGTON IRRIGATED LAND.

A. A. Terry, Langley, Island county, raises fruit, bees, poultry, hay and four cows as a side issue.

Receipts		Expenses	
Cream	$350 00	Hay	$200 00
Feed	40 00	Roots	50 00
Consumed	75 00	Grain	100 00
Calves	60 00	Pasture	10 00
Poultry, bees and fruit	1,200 00	Other feed	10 00
Total receipts	$1,725 00	Total expenses	$370 00
Profits	$1,355 00		

George F. Trott, Auburn, King county, keeps 42 good grade Holstein Friesian cows, devoting about 64 acres of land to the industry. He buys all hay, raising feed and enough ensilage corn to fill a 60 ton silo which saves him 30 tons of alfalfa hay yearly.

Receipts		Expenses	
Milk sold (265,758 lbs.)	$3,480 00	Hay (100 tons alfalfa)	$1,300 00
Fed to stock (15,600 lbs.)	195 00	Ensilage (60 tons)	240 00
Consumed (630 qts.)	18 90	Grain	75 00
Calves produced (18)	360 00	Pasture for 7 months	300 00
Cows, calves and pigs sold	697 65	Labor	820 00
		Losses	85 00
		Other expenses	100 00
Total receipts	$4,751 55	Total expenses	$2,920 00
Profits for year	$1,831 55		

GETTING STARTED

CAPITAL OR LABOR

The advantages of capital and in fact the very necessity for a certain amount are as evident in this line of enterprise as in any other. Naturally the person without funds must work for some one else until he has saved enough to start in for himself. If he can get work in some branch of the dairying industry, so much the better, for then he will be preparing himself with the necessary knowledge of the business, which is, if anything, of even greater importance than capital itself. In many cases, even those who come with sufficient funds would do

well to hire out unless they are already experts in the business and familiar also with the actual conditions surrounding the section in which they expect to settle.

There are always some established dairymen anxious to secure reliable and steady men who would be inclined to stay a reasonable length of time. The wages for such work, at present, are usually from $30 to $45 a month, although managers or superintendents receive from $75 to $150. These prices include board. Just as in any other line of work, the applicant possessing some experience and training along scientific lines, will stand the best chance of securing the most desirable positions.

ACQUIRING A DAIRY

After one has acquired some capital and all the necessary information, and he feels quite confident of his ability to manage his own farm with success, he is presented with several ways of securing one. He can purchase or rent a business already established, or buy the unimproved land and develop it himself.

It cannot be claimed that there are a great many chances for buying out dairymen, although according to the reports there are plenty of chances to rent. The terms for renting are either a cash basis or for about one-third of the crop to owner. The average person in such work during normal times, if he is fitted for it, is not inclined to sell, except at a fair profit, a business that promises a certain and pleasant means of earning a livelihood. Nevertheless, such opportunities do exist, but chiefly in the cases of those who for some reason or other are changing their residences to another section of the country, or desire to spend their declining days in the city. Occasionally, too, there are persons who, having become discouraged through some setback or other, often mismanagement, are willing to let go and give the other fellow a chance. Those already on the ground have the best chance of hearing about such opportunities. Others should look through the "ad" columns of the newspapers or communicate with the secretaries of commercial bodies, who could at least refer the prospective purchaser to reliable dealers who would probably have such places listed.

HOLSTEINS AT HOME IN THE YAKIMA VALLEY.

PURCHASING LAND

By far the largest number of beginners will probably purchase the rough land, buy a few first class cows and furnish their own equipment, gradually building up from a humble state to an independent position, like so many have already done.

First of all, it is necessary to find a place that appeals to one from a climatic standpoint and otherwise, and to secure a good piece of land which will produce fair crops. As previously noted, land may be obtained in any county of the state. In western Washington and the northeastern counties, unimproved land will probably be what is known as "logged-off." There are probably as high as 3,000,000 acres of such lands worth from ten to several hundred dollars per acre. The lowest priced lands are more apt to be grazing lands and quite close to the foothills. As some logged-off lands are more difficult to clear than others, these conditions together with the quality of the soil, distance from railroad station, and the lay of any particular piece, make considerable difference in the prices. One advantage of getting logged-off land for dairying purposes, where the difference in price warrants it, is that it does not need to be absolutely cleared to begin with, as it makes excellent pasture and the stock seem to enjoy searching around the stumps for the choice tufts of grass.

EASTERN WASHINGTON LAND

In the eastern part of the state, lands may be grouped as irrigated or irrigable, dry farming, and logged-off. The logged-off lands are chiefly in the northern part of Spokane county and all through Stevens, Pend Oreille, Ferry and Okanogan counties. A certain amount of irrigated land also is found in these sections besides the Walla Walla valley and elsewhere, but by far the largest areas of such lands are in the Yakima, Okanogan and Wenatchee valleys. Practically the remainder of eastern Washington lying within the big bend of the Columbia and extending eastward and southward till it blends with the Palouse, the Walla Walla country, and Oregon, is a grain country, but although wheat is the main crop, other crops suitable for carrying on the dairying and livestock industries may be raised to advantage.

In this part of the state, both in the irrigated sections where the large alfalfa yields are possible and in the rich grain sections, dairying should be carried on with the minimum amount of energy. Probably it has been held back most in the grain sections by the large wheat yields and the excellent prices obtained. It has recently been shown, however, by the efforts of the county agriculturists and many individuals who are determined to break away from the one crop proposition that dairying can be carried on even here with much advantage. There are already a number of creameries in this section and others

VALLEY FARMS NEAR TOLEDO, SOUTHWEST WASHINGTON.

will be encouraged to start as more farmers make up their minds to keep cows.

AMOUNT OF LAND

The amount of land a person should get depends somewhat on the nature of the country. He should first find out what can be done in the way of crops in any particular section and see that he gets enough land to raise all the feed for the cows he intends to keep. Forty acres ought to be plenty in most parts of the state, while in some localities good dairies are being maintained on less.

COWS AND EQUIPMENT

It is seldom advisable to start on a large scale. "I started with one two-year-old heifer and a milk pail," says A. Leichhardt, Kelso, who now has an outlay worth $35,000. The best

dairies were built up from a few well chosen cows and a purebred bull. The tendency now among farmers is to work towards a herd of purebred cows. Fortunately, nearly all good breeds do well and have their admirers. Good grade cows will cost from $60 to $125. Thoroughbreds will of course go much higher.

The advantages of dairying as a side issue, too, should not be forgotten. In fact, comparatively few depend on cows alone. Many of our most prosperous farmers keep such a number of each kind of stock besides chickens, turkeys, and other fowls, as will fit into the conditions peculiar to each farm. Interest in the work, too, is intensified by this motley array of faithful servants, comprising as they usually do, one happy and contented family, each member of which supplements the work of the others, and contributes its share toward the common bank account.

SUGGESTIONS BY EXPERIENCED MEN

By way of further encouragement a few suggestions from men of experience are appended.

F. S. Garred, Coulee City, Grant county, as a side issue, keeps 8 Durham mixture cows, worth $600, and devotes 30 acres of land to the industry. Raising as he does all feed on the farm, he can realize a nice profit which would otherwise be lost. He reports the total cost of production for 1915 as $175, receipts $690, and a profit of $510. He says:

"I prefer to explain that to start dairying here one should rent or buy some of this cheap land which does not produce the most of wheat. I do not contend that one should at present use our wheat land for dairy purposes, but only as pasture at times, if it is not in grain, which helps same when not in crop."

"Should one prefer to buy, perhaps three or four thousand dollars would establish one in living shape. Should one prefer to rent land, he would need but little besides the cows, say $500. Now there are others that seemingly start on nothing but their labor. We placed in our town a small creamery operating one year. Started on less than 200 cows. Have more than doubled our number of cows, and have every prospect of success."

A. J. Wagner, Ewan, Whitman county, raises cattle and keeps cows, geese, and turkeys. He doesn't think the dairying

industry can be overdone but advises a beginner "to take a full dairy course first, find a good place where water and pasture are good, where corn and alfalfa grow, where it isn't too cold or too dry, and close to a good town where he can sell milk bottled, and raise his calves."

R. L. Cook, Methow, Okanogan county, says: "I am a homesteader here. We started on our place without money. Until we got a few cows and a cream separator, I had to work out all the time and we went behind at that. Now we are slowly gaining. We milked only three scrub cows the first two years but we can say that dairying will pay and would pay big if we only had a little more capital. One good thing about it, one can do most all his own work and it is not hard work like so many other things, and the best part is a check coming every few days."

No better closing words for this chapter can be found than the following by G. van der Griend, Lynden, Whatcom county:

"Find a territory where land is not too high priced as yet, and make it valuable by improving. Have only milk cows that will under herd conditions, produce 300 pounds of butter fat. Have a registered sire at least, but if possible some registered cows as well. Cull out every mature animal that does not come up to your required standard. Then get a still better sire and raise your standard another 100 pounds. If possible get your neighbors to breed the same breed of dairy cattle. Organize a breeders' association so as to create a demand for your surplus stock, as is done in Jefferson and Waukesha county, Wisconsin. Breeding, alone, however, is not sufficient. Feeding is almost as important. Develop the young stock. Always have them in a thrifty condition, not by feeding fattening food, but by teaching them to consume large quantities, thereby giving them capacity. You are bound to have success, so will your neighbors, your community. Your land value will increase and though you may not make a fortune, as that term is understood at this present age, you will be assured of all the necessities and a great many of the luxuries of life, besides the satisfaction of knowing that you belong to that class of citizens, who as in the past so in the future, will always form the backbone of this great country of ours."

HARVESTING MANGELS IN MIDWINTER.

SWINE RAISING IN WASHINGTON

STATISTICS

The raising of hogs as a logical supplement to the dairy industry has always been recognized as a worthy enterprise by the majority of farmers, but as an independent industry or the main purpose of the ranch, its merits have never received such universal approval.

During the past six years a steady increase in the number of swine produced on the farms each year has been noticeable. While at the beginning of the year 1910, there were 183,000 valued at $10.50 a head or $2,488,000 total, on January 1st, 1916, there were 314,000 valued at $8.50 per head or $2,669,000 total. A fluctuation occurred, however, during the intervening years, the maximum number and value being January 1st, 1915, when there were estimated to be 327,000 valued at $3,630,000. The total number and value as estimated by the U. S. Department of Agriculture, each January 1st, from 1910, was as follows:

Date	*Number*	*Value per Head*	*Total Value*
Jan. 1, 1910	183,000	$9 40	$1,720,000 00
Jan. 1, 1911	237,000	10 50	2,488,000 00
Jan. 1, 1912	246,000	9 50	2,337,000 00
Jan. 1, 1913	258,000	11 30	2,915,000 00
Jan. 1, 1914	284,000	12 70	3,607,000 00
Jan. 1, 1915	327,000	11 10	3,630,000 00
Jan. 1, 1916	314,000	8 50	2,669,000 00

A FAITHFUL ASSISTANT

Without doubt the hog is almost a necessary member of the family of domestic animals on a well regulated Washington farm, and, if there are not too many of them, will about make his own way. In most cases, much material which would otherwise be put to no use whatsoever, will be turned into sweet flavored pork, commanding some ready money which could scarcely be more easily obtained, were the producer to find it.

In the logged-off land regions, too, he renders most valuable assistance in clearing the land, for he enjoys eating up all useless ferns and weeds and nosing down between the stubborn

roots of the large fir and cedar stumps, thus exposing their soft surfaces to the air and hastening decomposition.

CONDITIONS IDEAL

During normal years, with right management, there is no place in the world superior to the State of Washington for swine raising. The conditions already described in other chapters as being favorable to dairying and livestock industries in general are just as essential for the best success in producing hogs. Plenty of land may be had at reasonable prices, most of which will produce an abundance of suitable feeds or is valuable for pasture. Among the crops that grow well and which are splended for swine are corn, oats, wheat, barley, rye, field peas, beans, roots, pumpkins, potatoes, apples and artichokes, also grasses, clovers and alfalfa, besides many other miscellaneous plants. Nearly all parts have sufficient water, often running streams. There is plenty of sunshine, and trees for shade, and all other climatic conditions are such that help the hog in a rapid growth and tend to minimize the danger from pests and diseases, while the mild winters make possible two litters of pigs from the same sow each year, a condition taken advantage of by some breeders who hasten the growth of the pigs during the first 5 or 6 months, and then fatten for the market.

MARKETING

There can certainly be no trouble in disposing of the products in a state that is still shipping in millions of dollars worth. Hogs to the value of about two and a half million dollars were probably shipped into Washington during the year 1915. In addition, the United States Department of Animal Husbandry, reports 19,718,021 pounds of dressed pork, valued at $2,400,000, received at establishments where federal meat inspection is maintained in the State of Washington.

Our market for such products, the same as dairy and poultry products, extends as well to Alaska and Canada. Pork, bacon, etc., to the value of $142,427 was shipped to Canada and $641,904 to Alaska during the year 1915.

GETTING STARTED

When once in the farming business, it takes very little additional expenditure to start raising hogs, providing one is satisfied with a limited number at first. The State College advises buying purebred sows as the cheapest and easiest way to start. The same is true of hogs as of other livestock, each must decide for himself how many he can raise profitably. It is generally agreed that the safest plan is to keep no more than one can raise feed for. Attempting more, except under certain conditions, is apt to cause failure, for no one can depend on making a profit if compelled to purchase feed at the usual market price.

Right here occurs one of the principal dangers of loss, for unreasonable people, overestimating the hog's powers, often set him to the unprofitable task of turning into pork high priced materials shipped from a distance, even when the market price for pork is below the normal. The point is well illustrated by the experiences of the year 1915, when wheat brought exceptionally good prices all over the country, so that the man who depended on buying it for feed was certainly placed at a disadvantage, although the owners of wheat fields found it profitable to raise a limited number to pick up the wheat left by the reapers and which would otherwise not have been utilized.

All persons are instructed to choose a breed in which they have confidence and to make a careful study of the hog's habits, likes, and dislikes. They are warned against falling into the error of neglecting them, for although they are very hardy and will exist under adverse conditions, nevertheless there is no animal that pays so well for the extra care given. Many who raise hogs on a large scale take as great pains to keep them clean and to provide proper feeding as the most particular dairymen with their cows.

SUGGESTIONS AND FIGURES

Suggestions by a few of those already in the business may not be unacceptable to such as contemplate entering this work either in a large or small way.

L. J. Campbell, superintendent of the Stubblefield Home, Walla Walla, says: "To raise hogs for profit, feed must be largely raised and consumed on farm. Have nothing but pure-

HOGS THRIVE IN ANY PART OF THE STATE.

bred stock for all purposes. Start light; get one boar and 2 or 3 sows. Use individual pens, and see that they get plenty of air, pure water, and all the range possible." He estimates that a modest start could be made with three gilts at $25 each and one boar at $25, and four pens worth $15.

John B. Peterson, Montborne, Washington, raises about 150 purebred Duroc Jerseys, as a regular business. He says: "I sell most of my hogs when they are from six to eight weeks of age, except my breeding stock. I would suggest that a beginner start with purebred hogs. One can get good gilts and boars old enough for service from $25 to $40."

Preston Royer, Prosser, R. F. D. 2, Benton county, says: "A person with no experience should start in the hog business in a small way, as the correct feeding of the hog is difficult if properly done. A person cannot raise hogs at a profit on grain alone, but must have pasture and roots to balance the ration properly and cheaply."

I. L. Jones, Prosser, Benton county:

"I believe in lots of pasture and self feeder for fattening hogs. For new beginners I would advise using full bloods for breeding purposes, even if raising them for market as there is very little difference in the cost unless it is a show hog.

"As to marketing, here at Prosser, some of us farmers have been bunching our hogs together for a carload and then one of us accompanies them to Seattle, thereby we have been saving about 50c per hundred rather than selling to a local buyer."

John Meyer, Mead, Spokane county:

"I don't think it is profitable to try to raise hogs unless one should have good clover or alfalfa pasture and a good warm high house. It is most profitable not to raise too many at one time, unless one can take good care of them. A pig should never be stunted or it will never do well. If properly taken care of, it should at 8 months weigh 250 pounds. I have had them weigh more. I think it a good idea to have both clover and alfalfa pasture. Hogs do well on clover when it is in blossom. As to marketing, I market mine alive and find it more profitable than dressed. One should at least have 3 cents more dressed.

"I think one can get started very reasonably. One should get brood sows from $20 to $25. Four or five sows will give one a very nice start."

John E. Taylor, North Bend, King county, says:

"First, that to raise hogs at a profit one should raise their feed.

"Second, that he must have range fenced in—pasture preferred.

"Third, he must utilize all weeds, small roots, inferior vegetables and other waste products in feeding.

"Fourth, he should change pasture often. Whether the pasture is large or small, it should be divided into two or more lots, and hogs given fresh range every 10 to 20 days.

"Fifth, I find it pays best to sell when from 5 to 7 months old.

"I feed as above stated till pigs are 5 months old, then in addition to this ration I give corn meal and shorts (wet) twice a day. Pigs fed in this way will dress at 6 months 140 to 165 pounds."

SOME SUCCESSFUL ONES

Many producers in the state have made a success of hogs as an independent industry, although they are raised chiefly as a side product to dairying, with which they are naturally partners. When raised as a side issue either along with dairying or in connection with some other line of farming, if one does not get overstocked, there can be no doubt regarding the expediency of raising them during any kind of a year.

Senator C. W. Bethel, Harrington, Lincoln county, keeps about 300 hogs as a side issue to wheat raising. His figures for the year 1915 are as follows:

Receipts for Year 1915		Expenses for Year 1915	
Pork sold (3 carloads)	$2,562 00	Feeding (800 bu. wheat)	$800 00
Pork consumed (1,500 lbs. @ 10c)	150 00	Pasture (20 acres alfalfa)	400 00
Stock sold (19 pigs)	60 00	Labor (12 months @ $60, board and wages)	720 00
Increase in stock (100 shoats @ $4.00)	400 00	Other expenses—Team	250 00
Dressed hogs to consumers	320 00	My labor superintending	300 00
Total receipts	$3,492 00	Total cost	$2,470 00
Total profits	$1,022 00		

D. E. Crowley, Fairfield, Spokane county, keeps about 40 head of Poland Chinas as a side issue. He raises enough corn to fatten all of them in the fall.

ACCOUNTS FOR YEAR 1915

Receipts		Expenses	
Pork sold	$170 00	Feeding	$175 00
Pork consumed	48 00	Pasture	12 00
Increase in stock	250 00	Labor	15 00
Total receipts	$468 00	Total cost	$202 00
Total profits	$266 00		

Swannack Bros., Lamont, Whitman county, raise 60 or 70 as a side issue, Poland China breed crossed with Duroc:

"The only way we see to make money out of hogs is to fence your farm, hog tight, and then figure on growing 25 acres of alfalfa for pasture, and after harvest turn your hogs on the wheat stubble, as there is more or less waste from shelling and also grain stocks which would be a loss if you didn't have hogs."

Receipts for Year 1915		Expenses for Year 1915	
Pork sold	$772 92	Feeding (wheat and barley ground and fed)	$331 00
Pork consumed (1,000 lbs. @ 20c per pound)	200 00	Pasture (25 A. in wheat @ 20 bu. @ 90c, and feeding hogs)	450 00
Increase in stock (30 head @ $4 per head)	120 00	Labor for plowing, harrowing and seeding	70 00
		Other expenses (seed wheat, 25 bushels)	22 50
Total receipts	$1,092 92	Total cost	$873 50
Total profits	$219 42		

CORN ON SUBIRRIGATED LAND IN THE METHOW.

J. E. Trimble, Garfield, Whitman county, keeps from 50 to 100 hogs as a side issue only, pasturing them on alfalfa, peas and wheat stubble, then feeding corn. He says:

"I believe there is good money to be made in hogs in this part of the country by making the industry the main issue. One should raise plenty of roots and corn for feed. We are not bothered with cholera here."

Receipts for Year 1915		Expenses for Year 1915	
Pork consumed	$84 00	Feeding	$1,400 05
Stock sold	1,902 85	Pasture	200 00
Increase in stock	200 00	Labor	65 00
		Other expenses	154 00
Total receipts	$2,186 85	Total cost	$1,819 05
Total profits	$367 80		

W. E. Mintzer, Gordon, Douglas county, aims to keep about 40 hogs each year, chiefly Poland China and Berkshires. The year 1915 was the first that he made a profit, because he raised his own feed and hogs, instead of buying everything as he had in the past. He suggests marketing them dressed if possible:

"Use alfalfa pasture with barley or straw or headed barley. This keeps stock hogs growing nicely during the summer. I finish with corn, feeding 40 to 50 days, corn on the cob. For getting started in the hog industry you need 2 sows worth $40, a hog fence for 4 acres, $40, and alfalfa pasture."

ACCOUNTS FOR 1915

Receipts		Expenses	
Pork sold	$208 25	Feeding (44 head)	$85 00
Pork consumed	18 00	Pasture	40 00
Increase in stock	145 00	Labor	20 00
		Other expenses	25 00
Total receipts	$371 25	Total expenses	$170 00
Profit	$201 25		

E. Monette, Hunters, Stevens county, raises about 125 Duroc Jerseys, selling when from eight months to a year old and weighing about 200 pounds. He uses 50 acres for alfalfa pasture, turns into barley fields and finishes with ground wheat, barley, and corn.

Receipts for Year 1915		Expenses for Year 1915	
Pork sold	$1,155 00	Feeding	$400 00
Pork consumed	80 00	Pasture	100 00
Stock sold	86 00	Labor	75 00
Total receipts	$1,321 00	Total cost	$575 00
Total profits	$746 00		

W. E. Jennings, Mt. Vernon, Skagit county, raises about 150 Berkshires each year as a side issue, but the year 1915 was the worst he has seen. He says:

"We have winter or spring pigs and run them on pasture with a little grain till fall and fatten on the grain stubble after our oats are threshed and finish them on rolled barley.

"I have found out that by keeping just about what will clean up your waste grain and other waste, there is more profit in hogs than anything else, but when you go over a certain number, your profits go down for then you have to feed high price feed. Also you want to keep the type of animal that is a good grass hog, as on this side of the mountains we have the grass about nine months in the year."

ACCOUNTS FOR LAST SIX MONTHS OF 1915

Receipts		Expenses	
Pork sold	$1,112 53	Feeding (grain)	$700 00
Pork consumed	90 00	Pasture	150 00
Stock sold	35 00	Labor	110 00
Increase in stock (about same number)		Other expenses	45 00
Total receipts	$1,237 53	Total cost	$1,005 00
Total profits	$232 53		

Lawrence C. Irving, Cathlamet, Wahkiakum county, raises 20 O. I. C. hogs as a side issue to dairying. He says the year 1915 was poor, but shows some profit as indicated by the following figures:

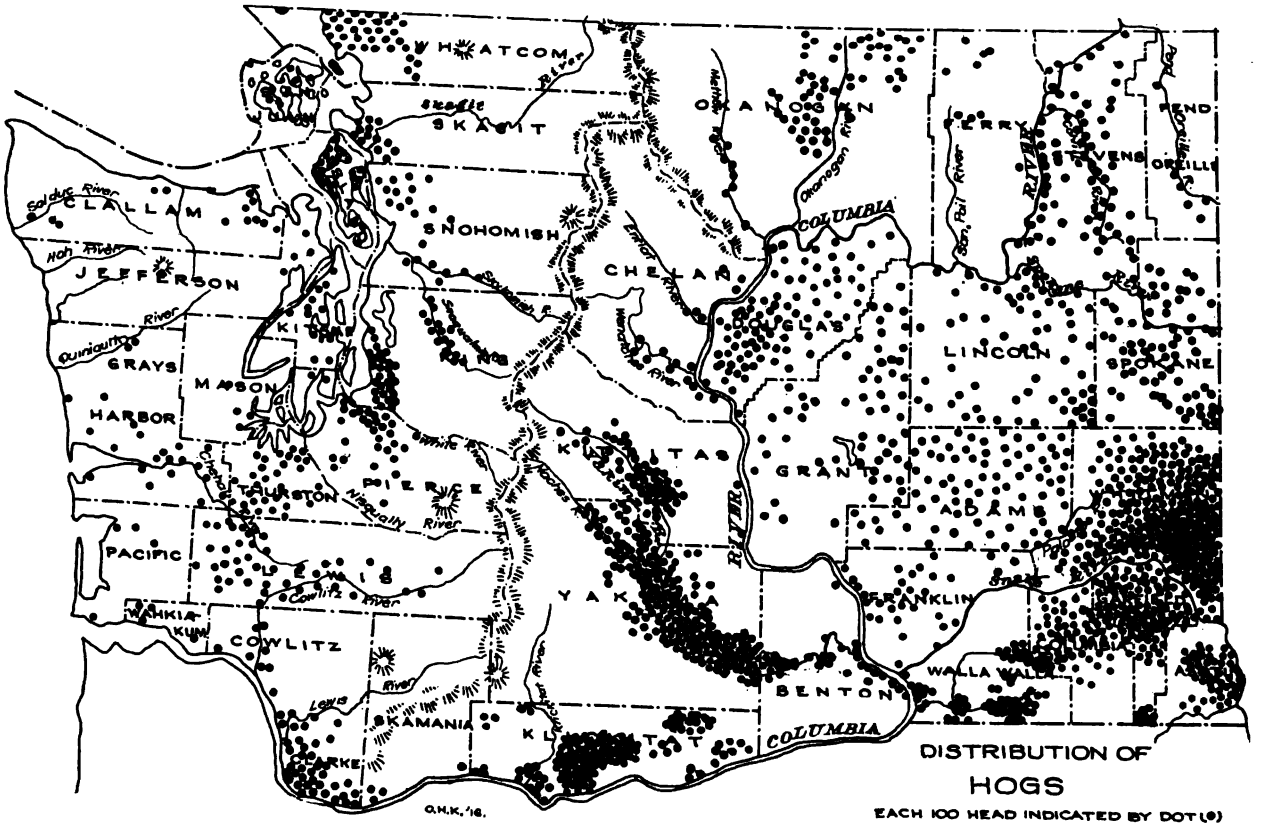
ACCOUNTS FOR YEAR 1915

Receipts		Expenses	
Pork sold	$250 00	Feeding	$50 00
Pork consumed	50 00	Pasture	25 00
Stock sold	10 00	Labor	50 00
Increase in stock	100 00	Other expenses	25 00
Total receipts	$410 00	Total expenses	$150 00
Total profits	$260 00		

Edward Ross, Camas, Clarke county, says:

"Every farmer should have at least one brood sow for his own use. He could easily get one for $30 to $35; the small pigs can always be sold for $2.50 each when 6 weeks old. If he kept 2 from each litter, he could sell at least 11 or 12 in one year, which would leave him the sow clear after the first year. I think that would be the safest way for anyone thinking of going into the business; if he finds that it pays, then he could go a little stronger year after year."

Receipts for Year 1915		Expenses for Year 1915	
Pork sold	$285 00	Feeding	$360 00
Pork consumed	26 00	Labor (7 months @ 50c day)	105 00
Stock sold (5 brood sows @ $30)	150 00	Other expenses	3 00
Increase in stock (35 pigs, one-day old, @ $1)	35 00		
Other receipts (5 pigs sold @ $3)	15 00		
Total receipts	$511 00	Total expenses	$468 00
Profits	$43 00		



DISTRIBUTION OF
HOGS
EACH 100 HEAD INDICATED BY DOT (•)

O.H.K. '16.

Edward Novvak, Gilmer, Klickitat county, raises 12 as a side issue to dairying. During the summer he cuts alfalfa green and feeds in racks, and wheat and barley ground with milk. He says:

"I market all my hogs dressed as we have long way to get to railroad or boat—24 miles. I find that I can keep more hogs in half-acre lot and cut and feed from one acre so they do not tramp out any of the grass. Cost of starting—I bought three pure bred O. I. C. sows eight weeks old at $10.00 each."

Receipts for Year 1915		Expenses for Year 1915	
Pork sold	$181 96	Feeding	$62 00
Pork consumed	13 92	Pasture	36 00
Delivering to market	10 00	Labor	24 00
		Other expenses	12 00
Total receipts	$205 88	Total cost	$134 00
Total profits	$57 88		

Chas. H. Greeley, Ridgefield, Clarke county, raises about 150 O. I. C.'s each year, "letting them run on clover or vetch pasture and giving skim milk until about 4 months old, also feeding some cooked cull potatoes, then putting them in a pen to finish on chopped wheat."

"I would not want to go into the hog business alone as the main profits I make are feeding the by-products of general farming to them. The little pigs thrive and grow fine if they have all the skim milk they want and good pasture and a very little grain. The shoats do fine on pasture, cooked potatoes and a very little grain. After the pigs are weaned, the old sows run on pasture and get cooked potatoes and do fine. I did not put down the value of the manure but it is one of the main profits. It is very rich and is helping to make my place better every year."

Receipts for Year 1915		Expenses for Year 1915	
Pork sold	$1,427 35	Feeding	$750 00
Pork consumed	60 00	Pasture	100 00
		Labor	275 00
		Other expenses	100 00
Total receipts	$1,487 35	Total expenses	$1,225 00
Profits	$262 35		

POULTRY RAISING IN WASHINGTON

SUPERIOR ADVANTAGES

DEVELOPMENTS

Since the report of 1912 was issued, poultry raising in the State of Washington has undergone considerable development. This is indicated by the larger number of fowls now being raised in the state, the increased number of persons in the business, the diminished quantity of poultry products shipped in, and the larger quantities being exported. It is also indicated by the showing our poultrymen have made at the different fairs of the northwest and particularly at the Panama-Pacific International Exposition, where Washington exhibitors owned over 700 fowls out of the 7,725 birds entered for premium and awards by exhibitors from over one half of the states of the Union, including California on the Pacific and New York on the Atlantic coast. This fair was open to world competition. "It was the greatest bird show ever held and surpassed even the fondest expectations of the judges and chicken fanciers." Competition was most keen, but Washington won 339 of the total awards and ranked second only to California, which state took first place.

This development of the past few years has been due to the continued success of those already in the business and to the increased demand for poultry products, not only from people in our own state but from other parts of the world. To be sure, the year 1915 cannot be pointed to as an ideal one for poultry raising any more than for various other lines. The abnormal conditions, world wide in influence, have affected the returns from this branch of endeavor as they have almost every other, increasing the profits for some and diminishing them for others. When viewing the advantages or disadvantages of any enter-

AN EASTERN WASHINGTON WHEAT FIELD JUST AFTER HARVESTING.

prise, however, it is the normal year that should be given chief consideration, with the abnormal as an enforced experiment merely, and for whatever light it may throw on the subject under certain circumstances.

FUTURE BRIGHT

But no matter what may have been conditions in the past, the closest observers are looking forward to and expecting very positive improvements in conditions affecting this line in the future.

These looked-for developments do not refer to any improvements in the natural opportunities for raising poultry, something not to be expected where nature has already so well provided, but rather to the more scientific handling of the business with more approved methods, and to the enlarged opportunity for disposing of the products by more nearly perfected marketing conditions. These are things that can be improved on in any country, but the influence of such improvements is bound to be felt most in those sections which are already well prepared by nature for the enterprise in mind. So, when we take into consideration the advantages this state possesses for producing, and the rapid ratio at which its population is increasing, we are compelled to believe that the poultry industry is about to be lifted to an even more prosperous plane.

STATISTICS

No statistics are harder to get than such as relate to the poultry industry. It takes so short a period to produce a laying hen, and so many families in towns and isolated places keep just a few, that figures compiled to show their value would be far from correct at the time publicity could be given them. It is still more impossible to tell how many eggs are produced. The result is that we have to be content with rough estimates only, often a mere guess. Not since 1910, has a census been taken. The figures gathered at that time are given here since they may serve as a matter of comparison to those thinking of entering the industry. The county assessors' valuations for taxation purposes are included in the table on page 95.

TABLE SHOWING NUMBERS AND VALUES OF VARIOUS KINDS OF POULTRY IN WASHINGTON AT DATES INDICATED, AND NUMBER OF FARMS REPORTING EACH KIND IN 1910.

KIND	1910 (April 15)				1900 (June 1)
	Farms Reporting		Number of Fowls	Value	Number of Fowls
	Number	Per cent of All Farms			
Total	44,906	79.9	2,272,775	$1,267,440	1,356,715
Chickens	44,862	79.8	2,204,114	1,239,328	1,196,630
Turkeys	3,557	6.3	16,049	36,268	29,155
Ducks	2,558	4.6	13,179	10,893	66,433
Geese	3,062	5.4	14,858	21,350	64,488
Guinea fowls	586	1.0	1,763	1,499	(*)
Pigeons	806	1.4	22,701	7,604	(†)
Peafowls	10	(‡)	54	171	(†)
Pheasants	5	(‡)	57	258	(†)

* Included with chickens. † Not reported. ‡ Less than one-tenth of 1 per cent.

ALL PARTS ADAPTABLE

All parts of the state are adaptable for this industry, although some sections have certain advantages over others. In every county quite a number are raised and there is no corner of the state where the joyous cackle of the hen is not familiar. The person seeking to start in the industry would undoubtedly have some preference when choosing his location. Generally the industry has received most attention nearest the centers of population. More than half the poultry is at present raised in the western counties with Pierce, King, Kitsap, Lewis, Snohomish, Whatcom and Thurston in the lead. The eastern counties are led by Yakima, Spokane, and Whitman.

CLIMATIC CONDITIONS

It has long since been demonstrated that of all useful creatures, the hen is one of the most sensitive to climatic influences, so that much of the effort of the poultryman is for the purpose of assisting her to adapt herself to the various atmospheric changes which she must resist during a twelve-month period without impairing her egg-laying tendency. In countries where the changes from one month to another are very marked, such effort becomes even more necessary and the purpose much more difficult of accomplishment.

First of all, where a cold climate prevails and violent changes occur frequently, much warmer, larger, and consequently more expensive buildings need to be constructed. More floor space must be provided in order that sufficient exercise may be possible during the longer period of confinement. The feed bill, too, would undoubtedly be greater, for experiments at various experiment stations have established the fact that, with a lowering of the temperature, hens must consume more in order to maintain the proper bodily warmth. These difficulties are least conspicuous in Washington, where extremes of temperature are rare and where the winters are comparatively mild, permitting general use of the open-front building the year round.

One of the results of such favorable climatic conditions is the remarkable freedom from diseases among the fowls. Only a few of those reporting, mentioned losses of this kind, and in every case, the loss was inappreciable. It seems to be agreed that there is hardly any danger from disease, providing ordinary precautions are taken. Where loss does occur, it is usually on account of inexperience or over confidence. Hon. Ed. E. Hardin, superior court judge of Whatcom county, speaks from experience, when he says: "I have found that the trouble which has caused the undoing of many would-be poultry kings, is failure to keep the birds free from lice, and overfeeding, especially of the young." Surely the eradication of this latter trouble would add to the profits in a double measure.

SOIL AND VEGETATION

The various crops possible in the State of Washington, have been mentioned under the subject of dairying. A few things, however, should be emphasized here. Successful poultry raising needs porous and well drained soil, soil that will also grow plenty of green material, this being considered of prime importance by many, especially if one is to hope for a liberal winter egg production. It is just as important that the chickens get plenty of green stuff as for cows to be fed fresh forage and for people to eat vegetables. Green food is easily secured the year round in Washington, especially west of the Cascades, where the thousand-headed kale and marrow cabbage will yield from 25 to 50 tons, and higher, to the acre. These plants will

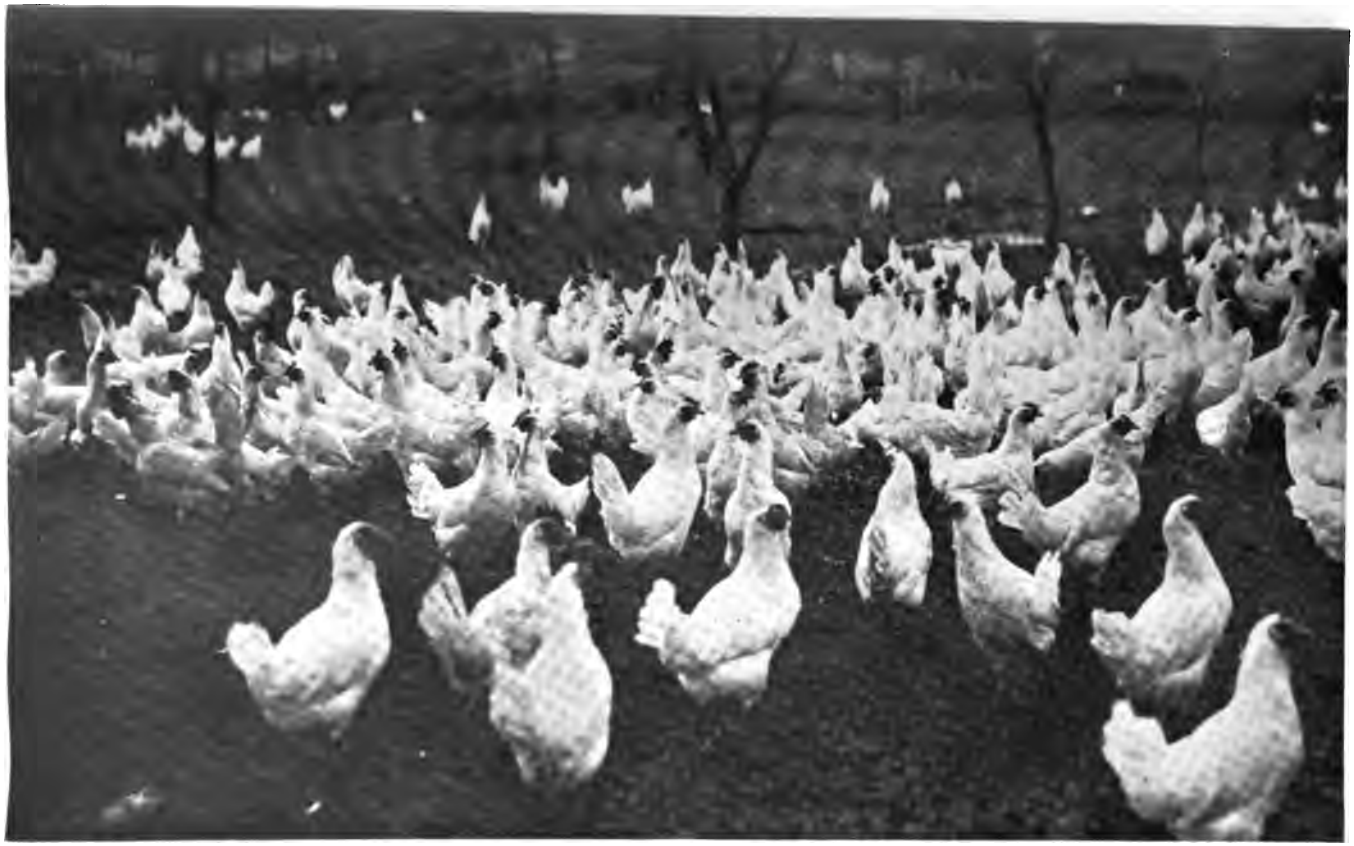
grow out of doors almost the entire winter, the lower leaves being cut off as needed. All grains suitable for the enterprise grow readily in any part of the state, although for commercial purposes, certain parts are devoted more to one than another. Washington is one of the most important wheat producing states of the Union. The grain is of high quality and is an advantage to certain sections which are saved the necessity of paying freight charges in addition to cost of grain.

EGG YIELDS

The final test is shown in the general vigor of the hens, and their high power as egg producers, especially during the winter season. As egg laying is the main purpose for which she is intended, this feature should certainly appeal to any one looking for a place to raise poultry. To get the hen to lay during the winter months, when eggs bring the best prices, is always one of the hardest problems in any country and much more so in countries not granted such moderate winters as Washington. The average egg yield for Washington hens is much larger than for the United States. World's records have been made in egg laying, one owned by D. Tancred, of Kent, having laid 295 eggs in 365 days, and another owned by Reed and Druly, Lynden, having laid 304 during a twelve-month period. John Thiel, Kirkland, had twenty-five 200-egg hens out of 250 layers, his best laying 245 eggs. C. Westergaard, Irondale, reports quite a number going beyond the 200 mark. S. C. Wolf, Palouse, Whitman county, says: "Our pullets laid all last winter and all summer and fall. They did not commence to moult 'till cold weather, when I sold them, for I never keep any hens over as I do not think it pays."

DEMONSTRATIONS AT THE WESTERN WASHINGTON EXPERIMENT STATION

There is no better argument to show the adaptability of this section for the poultry industry, than the demonstration recently carried on at the Western Washington Experiment Station for the management of pullets during winter months. Two pens, each containing S. C. W. Leghorns, 37 January hatched pullets, 39 hatched in March, and 24 hatched in May were used for the demonstration which was to show the difference in re-



RAISING CHICKENS AMONG THE ORCHARD TREES.

sults from the ordinary farm management and where the pullets are treated as "high grade, well-handled machines, worth the owner's best care and attention." In commenting on the experiment Prof. Geo. R. Shoup, who had the experiment in charge, says:

"The remarkable winter production recorded in the demonstration was made possible mainly by the fact that green kale from the field was available all winter. The other two essentials for duplicating the spring day of maximum egg production—warmth, and sufficient daylight for the hens to eat and assimilate the necessary amount of food to produce eggs—were furnished. Warmth was provided by building a modern coop with an easily manipulated draft-tight curtain, the one hundred birds confined in this wind-tight building keeping it warm. The extra hours of daylight needed were supplied by using a gasoline lantern. The birds were fed at 5:30 in the morning, at 3:30 in the afternoon, and again at 5:30. At 7:30 the green succulent kale was fed, and at 8:30 lights were turned out. The one hundred pullets had been laying about ten eggs a day up to the time of this special handling. The demonstration was started November 9, and the following statements were taken from the 1916 January and February Monthly Bulletins, in which the care, feeding and equipment were described in detail:

"This pen of one hundred birds under this special management would have averaged about two dollars a day net profit over cost of feed for the ten weeks following October 15 in a year of normal prices for eggs and feed."

STATEMENT SHOWING RESULTS OF PEN 2 IN EXPERIMENT BEING CARRIED ON AT PUYALLUP EXPERIMENT STATION

1st week.....	97	eggs at 45c per doz.,	$3 64	cost of feed,	$3 62
2nd week.....	223	eggs at 46c per doz.,	8 53	cost of feed,	3 77
3rd week.....	392	eggs at 45c per doz.,	14 70	cost of feed,	4 12
4th week.....	414	eggs at 43c per doz.,	14 84	cost of feed,	4 23
5th week.....	466	eggs at 42c per doz.,	16 31	cost of feed,	4 23
	1,592		$58 02		$19 97

Profit over cost of feed, $38.05.

6th week.....	485	eggs at 38c per doz.,	$15 35	cost of feed,	$3 88
7th week.....	477	eggs at 36c per doz.,	14 31	cost of feed,	3 36
8th week.....	463	eggs at 34c per doz.,	13 11	cost of feed,	3 36
9th week.....	442	eggs at 33c per doz.,	12 15	cost of feed,	2 93
10th week.....	421	eggs at 33c per doz.,	11 57	cost of feed,	2 93
	2,288		$66 49		$16 46

Profit over cost of feed, last five weeks.....	$50 03
Profit over cost of feed, first five weeks.....	38 05
Total.....	$88 08

GETTING STARTED

A large part of the success achieved in any enterprise is naturally the result of individual ability. The power to adapt is of great importance to every person. Those possessing this qualification in the largest degree, are most certain of making rapid headway. Those without it must learn from actual experience. This is certainly true in raising chickens. In no case, according to the advice of conservative men, should one begin operating on too large a scale, as the necessary experience can be got at much less expense than such a procedure invites, and a large farm is not needed in learning fundamental principles. It would be still better if the beginner would work awhile for some practical poultryman, especially if he hopes to engage in the work in a large way. In either case, too, one should attend the poultry shows, subscribe for some good poultry journal, and receive copies of all bulletins on this subject issued by the State College and the U. S. Department of Agriculture. These will help one to adapt the work to the different kinds of climate and the different soils, and to learn how to handle the different phases of the work.

For those ready to manage a complete plant, about 5 acres represents the ideal quantity of land, being sufficient for all necessary buildings, for producing plenty of green material, and raising vegetables and fruit for the table. Different opinions exist as to the number of fowls required to make a living. Professor Geo. R. Shoup, poultryman at Western Washington Experiment Station, says:

"We consider a plant of 1,500 birds—1,000 pullets and 500 older birds—a sufficiently large plant for one man and his wife to handle. There are various poultry plants of about this capacity handled along very similar lines in the Puget Sound country which can show a net revenue of about four hundred dollars a month during the high-priced egg season. It is our belief that prospective poultry raisers with a willingness to work and pay the strictest attention to the small details can earn a comfortable living in a country where the grass and kale stay green, and where the Experiment Station stands ready to assist by demonstration and advice at all times."

What is true of cows and other livestock is also true of chickens, viz.: "the best is none too good." It never pays to

save on the quality of stock, as the cost of keeping is as much for low grade as for purebred. Although, it may not be practical in every case to have absolutely purebred stock, still one should try to reach such a standard as fast as circumstances will permit. It seems that all breeds do well in this state, including the Mediterranean, American, English, Asiatic, and all miscellaneous varieties. As to which of these one should choose, it would probably depend on the locality in which he intends to settle and the breed for which he can feel a certain degree of affection. If one has started with a breed that turns out to be unsatisfactory, he should as soon as possible change for a satisfactory one. The strain, too, should be taken into consideration, some regarding this of greater importance than the breed itself.

Prof. H. L. Blanchard, Chimacum, Jefferson county, now superintendent of the Western Washington Experiment Station, has been out of active poultry raising but is now reorganizing his plant with the expectation of keeping about 1,200 White Leghorns and Barred Plymouth Rocks. He says:

"I am reorganizing the plant, and enlarging same, with implicit faith in the future of the poultry industry in western Washington. Managing poultry under the conditions that prevail in western Washington in particular is becoming better understood, and the true poultryman or woman can succeed. The beginner must begin modestly, manage carefully, and develop gradually. The 'plunger' in such matters will fail.

"The beginner ought to provide himself with all the Experiment Station bulletins, and literature, in this state, and keep in close touch with best methods of breeding and feeding, housing and general care, as is being continually recommended by these local institutions. In case he is inclined to the 'fancy' he ought to identify himself with a well conducted poultry association."

OTHER SUGGESTIONS

A number of other good suggestions for beginners are included in the following replies received from poultrymen in different parts of the state:

Mrs. J. J. Kashevnikov, Cle Elum, Kittitas county, aims to keep 2,000 Single Comb White Leghorns:

"The main thing for beginners in any location is to first have suitable, well sheltered houses adapted for the particular location. keep houses and poultry free from lice, and keep their houses clean

A FLOCK OF TURKEYS AT THE WESTERN WASHINGTON STATE HOSPITAL.

and dry. Watch your birds, get acquainted with their habits and give them the same attention that you would any other business that you would want to go ahead. Let your chickens get acquainted with you so that you can go amongst them at any time without them having the least fear of you; let them feel as though you were one of them and their leader. I find that chickens and other fowl outside of the turkey do well around this country, and although they need more attention, especially in the winter time, they are not so susceptible to the various fowl diseases here as they are in other localities."

C. Westergaard, Irondale, Jefferson county:

"At the present stage of advance in the poultry business I would advise the beginner to go slow. In fact, I would suggest that the average beginner seek employment with some really successful and practical poultryman who is carrying on the poultry business along lines that the learner expects to pursue. The business has developed so rapidly of late and competition is getting so keen there is little hope of success for any one in the business unless he adopts and practices up-to-date methods."

W. E. Ball, Montesano, Grays Harbor county, says:

"In this section, the Grays Harbor cities are supposed to constitute one of the best markets in the state, and should, as they are located 150 miles from the large centers, but some dealers have told me that 'eggs is eggs' to them, and I am trying in a slow way to educate them, that there is a vast difference between eggs and some other eggs. I am specializing in a guaranteed, unfertile, selected article. Here are a few suggestions for the beginner:

"1. Are you adapted to that line.

"2. Have you a liking for nature and animals.

"3. Have you been a failure, made good, or holding your own, through life.

"4. Have you a fair education, and willing to learn more.

"5. Have you grit (you'll need it as well as your chickens), and sticking qualities.

"6. Can you get a piece of land not less than 5 acres at a right price suitably located.

"7. Have you enough capital to pay for land and buildings. Don't go in debt too much.

"8. If you have these qualifications, start small with well bred birds of egg laying strain."

PROFITS FROM POULTRY

Many people are most easily convinced regarding the advantages of a country by the experiences of those actually in the business. The following expressions are from such persons, some of whom would be considered experts and others compara-

tively new in the business. Although it was impossible to obtain statements from every poultryman or to publish all received, still the excerpts given are considered quite representative. Many suggestions are given which can be read with profit by those contemplating such a line of work. The figures given are generally based on the year 1915, a year which, it should be kept in mind, was one of the worst experienced for some time.

Louis Hansen, Winlock, Lewis county, kept 250 White Leghorns on three-fourths acre of land. Expenses for 1915 were $312.50. Receipts were $514.54, and profits $202.04.

W. C. Galin, Odessa, Adams county, keeps about 1,000 White Leghorns. Expenses for year were $605.00. Receipts were $1,105.00, making a profit of about $500.00.

E. R. Stronquist, Hoquiam, Grays Harbor county, keeps 100 Single Comb Buff Leghorns and White Wyandottes. Expenses for year 1915, including considerable for improving stock and advertising, $396.33. Receipts, $497.88. Profits, $101.55.

J. L. Bowman, Enumclaw, King county, keeps 300 White Leghorns, Black Minorcas, and Barred Rocks: "I do not keep any record, but I know I can make a good living from 300 hens."

Walter Ricks, superintendent of schools, Pasco, Franklin county, keeps a few Silver Laced Wyandottes for pleasure only. He says: "Washington should be a great poultry state. The Columbia valley has a great climate and the proper soil and food relations for the growing of poultry. Don't send east for birds. I believe good birds can be obtained in the west."

Ole Martinson, Port Angeles, Clallam county, has 150 to 200 Rhode Island Reds and Buff Orpingtons, keeping accurate records of expenses and receipts. Profits for year 1913 amounted to $167.00 and in 1914, $125.00, without counting eggs and chickens consumed at home.

John E. Selden, Wilson Creek, Grant county, keeps about 450 Single Comb Rhode Island Reds, and White Leghorns, as a side issue, but employs no extra help. His expenses for the year 1915 were $440.00, and the receipts $878.00, making a profit of $438.00, or about $1.00 for each bird.

F. L. Wait, Richmond Beach, King county, leases five acres of land, three of which are cleared, one in orchard used as range

for young stock. He keeps 2,000 Single Comb White Leghorns. He says:

"I came onto this place to demonstrate to my own satisfaction whether or not I could make a success of poultry culture. I began in a very modest way, in the spring of 1913, with 200 day-old chicks, from which I raised and carried through the ensuing year an average of 82 2-3 pullets. During 1914 I raised and averaged for the year 204 pullets and in 1915 I raised and have now 200 pullets. I am also carrying over for demonstration purposes all of the stock I have raised, after culling out quite a number of non-layers. In my figures I have made no account of my time, or the cost of green stuff raised and fed. In making this statement I use the calendar year from October 1st to September 30th, of the ensuing year. I figure that one man should care for 2,000 hens. A reasonable salary would be $1,000 per year, or a labor cost of 50 cents per hen."

YEAR ENDING SEPTEMBER 30, 1914

Average number of pullets	82 2-3
Average number of eggs per hen	162.76
Average number dozens per hen	13.56
Average price per dozen per year	30.88c
Gross return per hen per year	$4.1873
Average cost of feed per hen	$1.32
Net return per hen	$2.8673

RECORD OF YEARLING HENS FOR YEAR ENDING SEPTEMBER 30, 1915

Average number of hens	74
Average number of eggs per hen	132
Average number dozens per hen	11
Average price per dozen per year	29c
Gross return per hen per year	$3.19
Cost of feed per hen per year	$1.46
Net return per hen per year	$1.73

RECORD OF PULLETS FOR YEAR ENDING SEPTEMBER 30, 1915

Average number of pullets	204
Average number eggs per pullet	164.25
Average number dozens per pullet	13.69
Average price per dozen per year	29c
Gross return per pullet per year	$3.97
Cost of feed per pullet per year	$1.46
Net return per pullet per year	$2.51

E. H. Rosenkranz, Colfax, Whitman county, keeps Single Comb Brown Leghorns. Starting with a flock of one dozen hens he has built up a plant containing now about 500, all thoroughbreds. He has eight acres of land, part of which is in apples and the remainder in pasture and alfalfa. He says:

"One man can easily take care of one thousand hens and if he makes but a profit of $1.50 per hen, it will bring him a nice income and let him and his family live a life of peace, comfort and independence. Success in the business, however, requires some capital, the lack of which is the cause of many a failure. But by far the greatest

and most essential thing is experience. The poultry business is like any other business, there must be knowledge, and experience will give us the latter. We all admit that the 200-egg hen does not run at large upon the farm. She must be bred up from the best laying specimen for years and will only then produce the 200 eggs under proper conditions. These conditions are first, housing; second, sanitary and comfortable quarters; and third, feed and care."

ACCOUNTS FOR YEAR 1915

Receipts		Expenses	
Eggs	$420 00	Feed	$250 00
Eggs consumed	35 00	Labor	45 00
Stock sold	300 00	Losses	50 00
Increase	100 00		
Total receipts	$855 00	Total expenses	$345 00
Profits	$510 00		

F. A. Norton, Grandview, Yakima county, aims to keep from 500 to 600 Single Comb White Leghorns and White Orpingtons for egg producing. He says: "The combination of climate, feed prices, and egg and poultry prices, are more favorable than in the middle west or east." He advises, however, against going in too heavy or expecting too much at the start. "It is much safer to grow into the business than to jump in."

ACCOUNTS FOR YEAR 1915

Receipts		Expenses	
Eggs	$1,070 50	Feed, estimated	$730 00
Eggs consumed	35 00	Labor, estimated	225 00
Selling stock	198 75	Losses	15 00
		Interest, depreciation, stock breeding, etc.	135 00
Total receipts	$1,304 25	Total expenses	$1,105 00
Profits	$199 25		

J. V. Peterson, Langley, Island county, keeps 500 Single Comb White Leghorns for utility strictly. In giving the following figures he says:

"We have kept no accounts of stock that we have lost, nor stock that has been consumed at home; we figure the one will offset the other. But we have kept strict account of all feed bought and all eggs and stock sold. We have, in the community, a cooperative organization, enabling us to buy our feed at wholesale prices, and our eggs, by grading and stamping, demand a premium above the market price.

A MODERN WASHINGTON DUCK FACTORY—A GROWING INDUSTRY.

We do not sell to the wholesaler but the fancy grocer is very eager to get our product."

Receipts for Year 1915		Expenses	
Eggs sold	$1,445 20	Feed consumed	$826 60
Consumed	54 75	Freight for marketing	30 60
Stock sold	126 39		
Increase in stock	100 00		
Fryers sold	97 68		
Total receipts	$1,824 07	Total expenses	$857 20
Profits	$996 87		

Arthur E. Gustafson, Eatonville, Pierce county, generally keeps about 400 White Rocks and White Leghorns. He advises starting with thoroughbred stock, keeping the strain pure and not to inbreed. He says:

"Last summer I hatched 600 chicks with 20 Rhode Island Red hens, set them on 17 or 18 eggs apiece, and gave the hatch from three hens to one. Some hens had as many as 45 or 48 chicks. I built a pen four feet wide, six feet long and eighteen inches high out of one-inch wire netting and a good coop for them to house in at night. The hen and chickens were both kept in this little pen; then the hen couldn't run all over and tire out any of the chicks. The pen is very easy to move when one place gets scratched."

ACCOUNTS FOR YEAR 1915 (270 Hens)

Receipts		Expenses	
Eggs	$380 62	Feed	$347 69
Stock sold	138 83	Labor	60 00
Other receipts	5 10		
Total receipts	$524 55	Total expenses	$407 69
Profits	$116 84		

W. C. Durkee, Arlington, Snohomish county, says:

"I have two small incubators, capacity 350 eggs, and I sold several hundred day-old chicks to my neighbors and could have sold a good many more. This year I expect to enlarge considerable, and raise all the chicks I can hatch. I also expect to use trap nests beginning next fall. I will caponize all roosters and see what I can do with capons.

"I keep a complete record of every egg or bird sold or consumed, also a careful account of feed and other expenses, and am well satisfied that there is a good profit in poultry if properly handled."

Short's Ancona Yards, Everett, Snohomish county. About 400 with 300 layers are kept of the Ancona and White Rock breeds. His accounts show the following:

Receipts for Year 1915		Expenses	
Eggs	$349 91	Feed	$581 74
Eggs and stock consumed	90 60	Losses	16 00
Stock sold	424 33	All others	40 00
Increase	230 00		
Other receipts	57 33		
Total receipts	$1,152 17	Total expenses	$637 74
Profits	$514 43		

A large poultry farm in Whatcom county has 2,500 White Leghorns for egg raising. The manager says:

"Last year the price of feed was unusually high and eggs were unusually low. I carry on my ranch almost altogether on hired labor, but under normal conditions should net $1.00 to $1.10 a hen. We average 10 dozen eggs sold per hen, which does not include those used for hatching or home consumption."

Receipts		Expenses for Year	
Eggs, stock, and day-old chicks	$7,729 40	Feed consumed and cost of raising young stock	$3,1[illegible] 0
		Labor, misc. expenses, taxes, interest, insurance, etc.	2,243 69
Total receipts	$7,729 40	Total expenses	$5,430 39
Total profits	$2,299 01		
Average profit per hen	92c		

A prominent poultryman in King county keeps about 25,000 layers and broods from 9,000 to 10,000 chicks.

Receipts for Year 1915		Expenses for Year	
Eggs sold	$7,480 00	Feed	$5,400 00
Eggs consumed	40 00	Labor	2,850 00
Stock sold	6,150 00	Losses	240 00
		All other expenses	2,050 00
Total receipts	$13,670 00	Total expenses	$10,540 00
Profits	$3,130 00		

Reed and Druley, Lynden, Whatcom county, keep 1,300 Single Comb White Leghorns, one bird of which laid 304 eggs during a 12-month period. They keep an itemized statement of all expenditures and receipts running from September to September. The manager says:

"The last two seasons eggs have been low and feed about normal; we paid as high as $48.00 for wheat last year, and $43.00 this; oats cost $40.00 and $35.00 for the same respective years, while corn aver-

aged $40.00. The net returns, not figuring labor, have been about $2.00 per bird. Our feeding cost has been about $1.45 a bird each year.

"We believe that success in this business lies more in the brooder house and raising the chicks right."

Arthur W. Wade, manager of the "Up-to-Date Poultry Farm," Marysville, Snohomish county, keeps about 1,000 Single Comb Brown Leghorns.

Receipts for Year 1915		Expenses	
Eggs sold	$2,081 43	Feed	$1,405 00
Stock, including chicks	863 90	All other expenses	405 00
Increase	187 50		
All other receipts	95 20		
Total receipts	$3,228 03	Total expenses	$1,810 00
Profits	$1,417 93		

J. J. Johnson, Palouse, Whitman county, keeps from 50 to 75 Single Comb Rhode Island Reds, and Dark Cornish Indian Game, raising them for eggs and as broilers. He says:

"I am in the variety store business and raise my chickens because I like the work, just the same as any other man may have his hobby and pass his time away. However, by close observation and hard work he can make his hobby pay in the chicken business.

"To the beginner, choose such variety or varieties as the public are looking for, and you will make no mistake. Housing is a great question for us all to decide and after all the climatic conditions must govern. Marketing is as essential as care and feed because here is where we lose or gain. Conditioning fowls for market should be paramount at all times. Too many poor weak scrawny fowls come to market and lessen the chance for one offering the best.

"To the new beginner I would say buy good stock, go slow, pick your way and learn to master a few things, then, if the going is to your liking, hop to it and stride as far as you like. Statistics say 90% fail in business mercantile world while 10% make good—but I say there is no chance to lose in poultry business if you will follow the plan suggested—go slow."

Lewis Blau, Elberton, Whitman county, although keeping only 85 hens has proved their profitability on a small scale. His figures show a net profit of $1.55 per fowl each year.

"It is easier to make a hen lay eggs in the winter time than it is to make a cow give milk. I have not figured the chickens consumed by the family, but this amounts to fully as much as the labor in caring for the flock is worth. I can most truthfully say that I have been very successful in my farming, hog raising and dairying; but none of these

lines could ever afford me the profit on labor and money invested as my hens."

Receipts During Year 1915		Expenses for Year	
Eggs	$112 64	Feed	$50 00
Eggs consumed (conservative estimate)	35 00	All other expenses	5 00
Stock sold	27 70		
Increase	12 00		
Total receipts	$187 34	Total expenses	$55 00
Profits	$132 34		

J. S. McIntosh, Olympia, Thurston county, although starting on a small scale and chiefly as a side issue, has met with much success. On January 1, 1915, he had 96 hens.

Receipts During Year 1915		Expenses for Year	
Eggs sold	$264 43	Feed for year	$229 27
Stock sold	47 85	Male birds purchased	10 00
Increase in stock	59 50		
Total receipts	$371 78	Total expenses	$239 27
Profits	$132 51		

W. F. McCracken, Anacortes, Skagit county, aims to keep 200 Mottled Anconas, or White Leghorns, all layers, on three city lots. His bookkeeping for the year 1915 records the approximate expenses as $285.00, and the receipts as $540.00,

AN IDEAL CHICKEN RANCH.

representing a profit of $255.00. He buys baby chicks instead of the eggs, claiming the loss to be lighter this way. He buys his grain in ton lots. He says:

"I have a farmer bring me about 30 dozen sheaves of oats. I use it instead of straw and let the chicks thresh it themselves; also buy 1½ tons mangels in fall at 35c a hundred. Fine feed. Raise about 300 head of thousand-headed kale. The work takes very little time and I enjoy it. I stamp all my eggs and date them and clean every dirty egg. Splendid local market. My name on every egg helps. If there is anything wrong the customers of the store know where the eggs are from."

Mrs. Kate Hodgson, Orient, Ferry county, has a few on a homestead while improving it.

"We just have a house for the hens and a yard. I am selling eggs at the present time (Feb.) for 40c per doz., which pays for their care with a good profit besides. I find that the main requirements are a good warm house with plenty of light, with a variety of grain, and vegetable feed, a warm drink several times a day in order to get the profitable eggs (winter eggs). It pays better to keep a few fowls well tended than a lot neglected. Give your hens a variety of feed in the winter time, also in summer, if they cannot get it. Make pets of them and they will repay you with a full egg basket."

Christ Aasen, Alstown, Douglas county, keeps about 750 White Leghorns. The cost of each bird for feed is about $1.00. Receipts for eggs sold about $2.42, leaving a net profit per bird of $1.42; the increase in stock and eggs consumed paying for the labor. He says:

"At the present high prices in grain, I would not produce poultry for meat, not chickens anyway. A non-setting, small breed should be selected. We never buy any birds, as that is very likely to bring in sickness and vermin. We send for eggs to the very best breeders, and hatch them ourselves, for new blood in the flock. We did the same when we first started in the poultry business.

"We keep 750 chickens in one big house, consisting of 3 rooms, one 16x40 for roosting room, and 2 rooms for scratching purpose, each 20x30. Water is piped into one of them. To build a number of small houses cost more, and we have good luck keeping them together.

"We cannot fill the demand for our eggs. In raising the small chicks we use incubators and fireless brooders. In them the chicks furnish their own heat. Animal heat is much better than artificial heat."

Among small owners who have made a success, is A. S. Newland, Ritzville, Adams county, who aims to keep about 250 White Leghorns. His accounts for the year 1915 are as follows:

Receipts		Expenses for Year	
Eggs sold	$263 00	Feed	$200 00
Eggs consumed	105 00	Labor	25 00
Stock sold	50 00	Losses	50 00
All other receipts	50 00	Interest and expenses	50 00
Increase in stock (175)	115 00		
Total receipts	$583 00	Total expenses	$325 00
Profits	$258 00		

or a little more than a dollar a hen.

Thomas P. Horn, Olympia, Thurston county, a man of wide experience in the poultry business now keeps only 50 White Wyandottes on a city lot as a diversion from his main work.

ORPHAN LAMBS BEING RAISED ON THE BOTTLE.

He buys all his feed and the records indicate that it costs him approximately $1.60 per year to feed a hen.

ACCOUNTS FOR YEAR 1915

Receipts		Expenses	
Eggs sold at market prices	$71 30	Feed consumed	$108 60
Eggs sold for breeding purposes	30 00	Labor (not figured)	
Eggs consumed	31 40	Losses (accidents to birds, etc., estimated)	20 00
Fowls consumed	18 30	All other expenses (additional equipment—cost of exhibiting)	48 50
Stock sold, principally breeding stock	64 50		
Increase in stock (30)	90 00		
Total receipts	$305 50	Total expenses	$177 10
Profits	$128 40		

In commenting on the poultry industry, Mr. Horn says:

"The year 1915 was the poorest year I have ever seen in the poultry business—feed high, eggs low, no demand for breeding stock. Business picked up wonderfully beginning with 1916 and I believe the year will be a really good one.

"My whole plant covers less than a city lot, no account is taken of my own labor, it is my recreation. I raise a small flock of the best birds it is possible to raise by care and study. The birds pay their way and more. In normal years the margin is considerable more than is shown for 1915.

"My advice after some seventeen years close study of the poultry business is this: Start easy, work hard, study much. Use horse sense, cut out the dreaming and stick to it. If this road is followed, almost anyone will succeed in making a good living at a pleasant, healthful and interesting business.

"There is much room in Washington for good poultrymen and good poultry farms. The climate is right, the markets are here, land can be had at a reasonable figure."

TURKEYS, DUCKS, GEESE AND OTHER FOWLS

Many people in the state find the raising of other fowls besides chickens profitable and recommend them to others desirous of entering some branch of the poultry industry. Turkeys, ducks, geese, pigeons, guinea fowls, peafowls, and pheasants are all raised to a certain extent, although only the first three have reached any degree of importance. The propagation of pheasants is chiefly for game purposes. Pigeons are raised both for carriers and for food purposes, a few persons making quite a specialty of squabs, which find a ready market.

DUCKS

Ducks are excellent layers and their eggs are relished by many people equally with hen eggs. Among the kind mentioned by those giving information regarding this industry are the Indian Runner, the Mammoth Pekin, and the Buff Orpington. The Runners are, no doubt, the most plentiful; being kept especially because they are prolific layers. Their meat also is good but they do not reach the size of some other birds. There seems to be a good market for both meat and eggs.

Eugene W. Davies, Jr., Everett, Snohomish county, secretary of the Cumberland White Egg Indian Runner Club of America, has for six years kept English Pencilled Indian Runner ducks. The following quotation by him ought to be of more than passing interest to beginners in the industry:

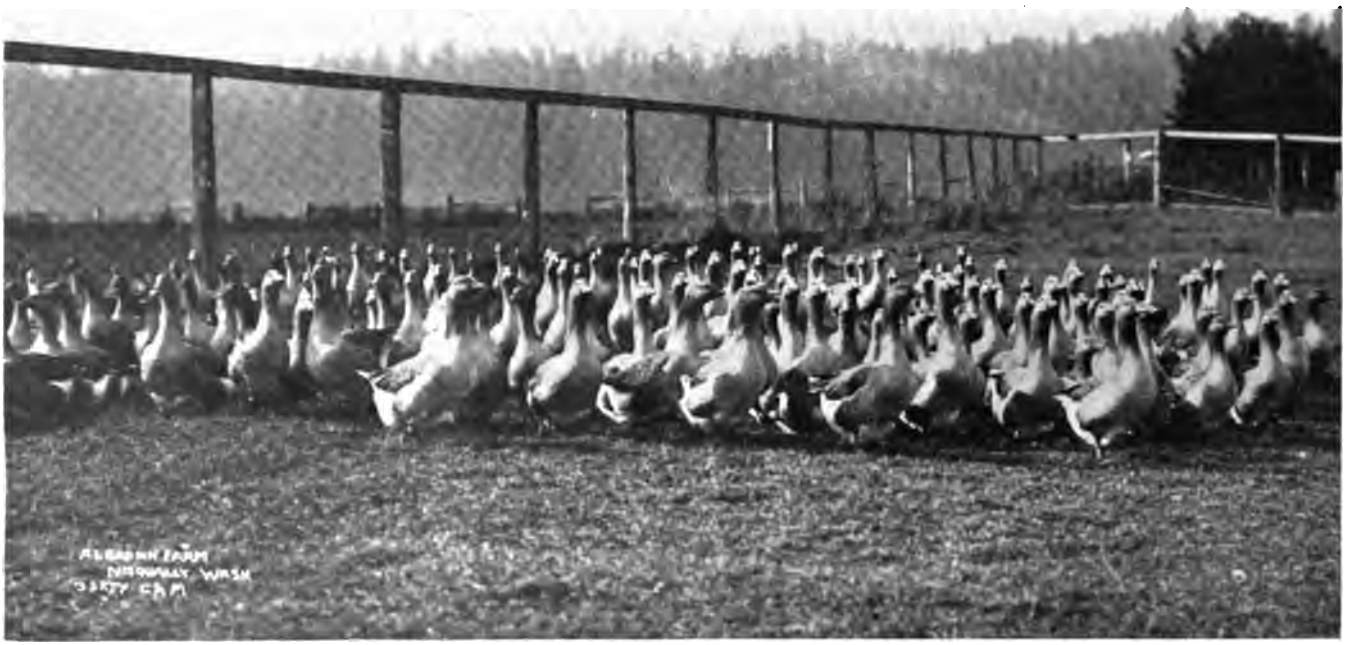
"The possibilities for profit for the breeder of the English Pencilled duck I believe are greater than that to be derived from hens. But at the same time I would not advise any one going into this business on a large commercial scale without first establishing a market for the eggs. The public must first be educated up to the advantages to be derived from the use of Runner eggs as against the hen eggs.

"In fact, these Runner eggs have been tested at the University of Washington in competition with hens eggs, and found to be of superior flavor and economy. The State College of Texas also carried on a series of experiments with the same results.

"I would advise every farmer in Washington, especially in the Puget Sound country, to keep half a dozen Runner ducks, enough to supply the family. These birds do not mind the rain, water runs off their backs very easily, and they will produce eggs in October, November and December, when eggs are at the highest in this section. My birds last year averaged 17 eggs each in October, 18 eggs each in November, and 14 eggs each in December, these eggs sold for 50 cents a dozen, bringing in nearly enough to feed them for the balance of the year. The houses and yards for the ducks are much less expensive and simpler than for hens. Any open shed where the ducks can be in the dry at night is all that is necessary, and in the matter of yards, just a two-foot fence of wire, which one can easily step over is all that is needed to keep them in confinement. This item of fencing alone would amount to a considerable saving over chicken culture if one were going into it on a large commercial scale. The care and feeding of ducks is much less trouble than for chickens. I feed once a day only, about 5 p. m. The ducks lay all their eggs in the early morning hours, and can be turned out to range at 8 a. m. and be no more trouble until feeding time at night. The ducks are never bothered with roup or lice, which is another big item of worry taken off the farmer's mind."

Among great enthusiasts for the Buff Orpington is Mrs. James Blackburn, Opportunity, Spokane county. She started in 1913 with only 4 ducks and a drake, getting everything she could to teach her the best ways of raising them at a profit, and from her experience has come to the conclusion that they are the best money makers a farm can have. In the year 1914 she got 3,109 eggs from 22 ducks. She says:

"1914 was my second year with them. I started in 1913, with four ducks and a drake, getting every thing I could to teach me the



GEESE PREPARING FOR THE CHRISTMAS FESTIVITIES.

best way to raise ducks at a profit. I hatched 107, raising 104. Three drowned. Well, at the beginning of 1914, I had for breeding only 22, as I could not keep any more for the rush of orders for breeding stock. But I managed to keep 22 in all. They began laying December 3, 1913, and laid to August, 1914, laying 3,109 eggs. I set 400, raising 300 ducklings to about 4 weeks old, when a rain caught them, but I saved 250 ducklings. I sold 2,800 eggs at $2.50 per 13 in the United States and $3.00 in Canada, and my breeding stock for $5.00 for the drake and $2.00 for the duck until Judge Tucker told me that they were worth $10.00 each, then I sold them for $3.00. They cost about $1.50 each for feed. When feed got so expensive, they cost about $1.75 each. The labor costs me nothing, as we do it with so much pleasure.

"I have never kept a duck that could not take at least second prize in any show. I breed none. They begin laying at about 5 to 5½ months old, but I have had them lay at 4½ months. They lay 235, 238, 258 eggs each. They average six pounds dressed and the standard weight is 7 to 8 pounds. The flesh is yellow, tender and juicy.

"One good thing about the Buff Orpington duck, you need not hatch every year to get layers, for they lay up to their fourth, fifth and sixth year with a profit. You do not have to fight lice, mites, white diarrhea, limberneck, or gap worm for they never have them. They do have rheumatism, *if kept in the damp.* But if kept dry, and well fed, but not over fed, you have a bird well worth its weight in gold."

ACCOUNTS FOR YEAR 1915

Receipts		Expenses	
Eggs sold (2,800)	$257 60	Feed consumed	$75 00
Eggs consumed	5 00	Losses (50 ducklings)	25 00
Stock sold (165 for breeding)	410 00		
Other receipts (45 killed for meat)	45 00		
Total receipts	$717 60	Total expenses	$100 00
Profits for season	$617 00		

Mrs. M. Jordan, Spokane, Spokane county, raised Mammoth Pekin ducks which won first, second and third prizes at Spokane Interstate Fair. She says:

"If a person lives where there is a running stream of water, the ducks will be found very profitable, as they derive most or quite all of their feed from the water and in this way, they would not be considered any trouble.

"Washington, I have found with my small experience, is very good for duck raising and really the occupation is very fascinating, as they are no trouble whatever, when well fed, and they seem to appreciate the attention of folks around them."

TURKEYS

Turkeys are raised both in eastern and western Washington. Some raise them in large flocks but the majority raise a few along with other poultry. The most popular variety seems to be the Mammoth Bronze. They need the greatest care while they are less than eight weeks old. After that, they become very hardy and will get most of their own feed if sufficient pasture is supplied. They will always bring the top notch prices, especially at Thanksgiving and Christmas time. The State College, Pullman, has issued a pamphlet on the raising of turkeys, which may be obtained by application to that institution.

A. H. Horton, Mercer Island, King county, who has had considerable experience with turkeys, raised 30 of the Mammoth Bronze in 1915. He considers them profitable and future possibilities good. The following excerpt from his letter should be of much help to the beginner:

"The great trouble in raising turkeys is in handling them right. In the first place the breeder should be certain of having good stock with strong vitality. If he hasn't already the stock and wants to start with eggs he should buy his eggs from a reliable breeder known to have good stock. These eggs can be hatched under good ordinary hens, either Plymouth Rocks, R. I. Reds or some of the Asiatic breeds that are good, large birds. After the hatching the trouble begins. First, he should be certain his hens are free from lice or vermin of any kind a few days previous to the hatching, and take care to keep both the hen and the little turks free from any parasite that is usually troublesome to poultry, particularly lice, head lice, and mites. Then his coops and yards must be on good dry ground, as the little turks must not be allowed to run in the wet grass, or to get wet in any way. Then, with the proper feeding he should have no trouble in raising at least 75% of his hatch."

H. H. Keim, Ridgefield, Clarke county, raised about 75 of the Mammoth Bronze variety in 1915. He considers that there is a good and growing demand for turkeys and very little likelihood of overdoing it.

"We keep 10 to 12 hens and pullets, selecting them before marketing and buy a new tom, a big young turkey, every year. We let them have the run of Island Farm—nearly a thousand acres. There is a fringe of cottonwood timber along river. There they mate and nest and raise their broods. We seldom see them till large enough to fly up and roost on the fence. Our turkeys are out now for a month, nesting and laying. They will come off the nest in May and will then

raise a second brood if any ill luck comes to the first. Every large farm should have a flock."

C. Harrison Green, Seattle, King county, who runs the Peerless Ranch, raised over 100 Mammoth Bronzes during 1915, losing only one out of a flock of 80 in four months. He considers them a profitable industry and that the future possibilities for them in the state are excellent.

"The raising of turkeys in my estimation, is more interesting than chickens. Anyway, it is so with us. We moved from the city to the ranch to take it up, and the best block in Seattle could not lure us from the ranch. We fully expect to raise between 300 and 400 turkeys this spring."

GEESE

A few geese will be found on nearly every farm, but very few are making any particular business of them, although there seems to be money in them, under proper conditions. Mrs. H. G. Moses, who keeps a few, says of them:

"They are very hardy and will stand any kind of weather, after they are 6 or 8 weeks old. They do not need much housing in this climate and if properly raised, they will start in laying in December and lay almost continually until July and August, when they start moulting. If they have all the grass they want, they require very little grain. The young grow very fast—we have had them weigh 10 pounds at 3 months old."

W. D. Good, of Mt. Vernon, gives a representative statement of what can be done in developing this branch of industry:

"I have been in the poultry business for about eight years. I have had about twenty varieties of poultry but find that Toulouse geese are the easiest and most profitable to raise, that is, when a person is in the right location. They would not do well on a city lot with no water. I have several acres of waste land outside of the dike where they can go in the water and rustle their own living. Sometimes I keep them in the field with the hogs and other stock."

J. W. Morris, a man of wide experience and manager of the chicken department of the Willows Poultry Ranch near Redmond, says:

"If you have plenty of pasture geese can be raised to advantage, for they will practically keep themselves until you are ready to fatten them. The Indian Runner ducks, too, will pay equally as well as chickens, for they are good layers."

TABLE SHOWING NUMBER AND VALUE OF DOMESTIC ANIMALS IN WASHINGTON BY COUNTIES AS RETURNED BY COUNTY BOARDS OF EQUALIZATION FOR YEAR 1915.

(For approximate actual values multiply valuation figures by 2.36.)

	COUNTIES	HORSES*		WORK HORSES		STALLIONS		MULES AND ASSES		STOCK CATTLE†		MILCH COWS		
		No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	
1	Adams	3,637	$81,465	7,981	$408,850	62	$9,180	1,717	$75,490	5,230	$95,040	2,228	$67,080	1
2	Asotin	2,689	76,090	1,824	99,385	29	4,695	188	7,145	4,769	98,235	813	24,475	2
3	Benton	1,559	31,445	1,807	97,775	22	2,665	108	4,695	3,077	36,550	2,092	62,915	3
4	Chelan	1,890	37,525	1,504	71,295	5	715	209	9,590	1,313	15,420	1,380	37,120	4
5	Clallam	596	13,596	1,179	56,352	10	1,725	50	2,225	2,469	23,321	3,669	84,277	5
6	Clarke	988	23,245	4,123	147,145	17	2,925	97	3,015	6,675	54,005	10,106	208,155	6
7	Columbia	2,878	52,350	4,554	177,200	43	6,290	1,295	56,810	4,284	63,870	1,507	40,240	7
8	Cowlitz	624	16,136	856	41,060	3	700	6	290	3,260	33,615	3,057	70,914	8
9	Douglas	5,998	97,515	8,997	308,280	58	10,660	1,109	36,390	3,787	43,875	2,696	64,420	9
10	Ferry	2,163	74,392	247	19,755	9	2,625	127	5,615	3,759	70,358	877	29,520	10
11	Franklin	1,192	24,756	2,211	82,585	16	3,395	475	21,893	735	10,898	528	15,688	11
12	Garfield	4,159	82,548	3,108	134,018	48	6,874	405	13,680	6,698	95,126	727	15,900	12
13	Grant	3,634	71,186	5,216	201,050	21	4,160	566	19,054	4,627	66,914	2,237	46,510	13
14	Grays Harbor	992	30,096	1,526	87,935	6	1,010	23	1,050	3,969	53,450	4,327	105,695	14
15	Island	324	9,595	608	26,765	2	275	11	330	1,007	7,370	2,647	69,430	15
16	Jefferson	58	1,385	473	26,045	1	200	2	40	765	9,437	1,657	41,425	16
17	King	4,089	147,467	8,644	573,935	63	12,088	400	21,063	7,340	116,015	21,202	696,577	17
18	Kitsap	1,144	30,298	229	14,940	2	600	1	50	1,121	12,889	2,844	73,208	18
19	Kittitas	2,901	65,110	3,112	166,965	37	5,075	101	5,185	9,688	177,880	3,518	125,350	19
20	Klickitat	4,833	47,877	3,059	67,550	46	3,191	295	5,515	6,682	58,337	1,973	27,713	20
21	Lewis	1,738	45,826	3,557	200,091	12	2,340	58	3,105	10,290	127,437	10,926	298,198	21
22	Lincoln	7,580	200,875	14,685	729,215	82	16,050	1,845	89,395	9,348	108,205	4,896	123,325	22
23	Mason	396	10,540	442	20,740	2	350	3	120	1,485	17,892	1,424	39,840	23
24	Okanogan	6,982	133,705	6,773	252,585	112	14,155	442	16,806	19,553	388,205	4,460	135,080	24
25	Pacific	300	7,010	651	27,580	2	275	4	75	3,100	37,750	1,962	49,041	25
26	Pend Oreille	212	4,172	1,091	42,719	8	920	33	950	1,419	16,301	762	16,811	26
27	Pierce	3,659	124,029	2,527	129,389	17	3,940	74	4,034	13,153	270,023	3,158	93,670	27
28	San Juan	329	10,670	783	46,570	8	2,300	.....	.....	1,348	11,140	1,685	42,645	28
29	Skagit	1,031	30,820	2,293	99,150	19	2,365	18	475	9,464	106,665	7,075	170,990	29
30	Skamania	54	1,168	330	9,620	1	25	11	240	380	5,170	527	13,195	30
31	Snohomish	1,705	49,580	3,213	162,850	7	1,095	46	2,275	10,614	100,310	13,702	349,585	31
32	Spokane	4,389	97,155	14,406	600,675	68	8,515	585	23,820	8,649	96,170	9,872	243,805	32
33	Stevens	3,008	47,908	4,854	165,325	21	2,025	150	5,020	7,991	91,844	4,961	108,108	33
34	Thurston	1,164	32,339	1,914	96,597	24	3,275	36	1,390	5,920	54,809	5,185	133,102	34
35	Wahkiakum	66	1,656	298	9,834	.....	.....	.....	.....	1,004	11,352	2,022	40,440	35
36	Walla Walla	3,714	96,890	7,821	378,725	51	7,985	3,230	176,430	5,572	87,985	3,198	111,415	36
37	Whatcom	1,414	26,322	3,992	132,482	15	1,988	39	1,348	9,284	78,502	11,878	227,102	37
38	Whitman	9,006	250,256	19,844	929,040	133	28,610	2,008	87,140	13,009	195,740	7,736	234,425	38
39	Yakima	6,818	179,415	9,956	527,110	61	10,800	468	23,585	20,562	368,225	9,401	413,960	39
	Totals	99,833	$2,364,356	160,747	$7,369,132	1,143	$195,921	16,185	$725,282	232,400	$3,295,920	174,985	$4,741,349	

* All excepting work horses and stallions. † All cattle excepting milch cows and bulls for breeding purposes.

TABLE SHOWING NUMBER AND VALUE OF DOMESTIC ANIMALS IN WASHINGTON BY COUNTIES AS RETURNED BY COUNTY BOARDS OF EQUALIZATION FOR YEAR 1915.—Concluded.

(For approximate actual values multiply valuation figures by 2.36.)

	COUNTIES	BULLS, For Breeding Purposes		STOCK SHEEP AND GOATS		SHEEP BUCKS, For Breeding Purposes		HOGS		POULTRY	Total Assessed Valuation of Livestock 1915	Total Assessed Valuation of Livestock 1911	
		No.	Value	No.	Value	No.	Value	No.	Value	Value			
1	Adams	128	$4,330	8,299	$20,680	6,737	$16,705	7,892	$23,115	$10,635	$792,580	$775,820	1
2	Asotin	97	2,475	16,707	37,320	117	585	4,610	12,430	2,660	360,495	288,710	2
3	Benton	70	2,895	69,307	138,630	212	795	3,001	15,705	6,600	400,650	337,275	3
4	Chelan	38	1,440	2,166	4,235	.....	.....	1,683	4,990	2,415	184,735	198,990	4
5	Clallam	133	2,662	1,035	1,740	13	33	1,304	4,239	2,502	192,672	171,658	5
6	Clarke	356	6,205	1,311	1,663	95	130	3,477	11,022	9,870	467,380	524,150	6
7	Columbia	101	2,510	20,337	30,230	218	980	5,554	13,100	.....	443,590	444,400	7
8	Cowlitz	180	5,050	786	1,418	7	15	.....	6,725	2,026	177,949	258,662	8
9	Douglas	71	1,805	631	1,085	4	15	7,811	24,480	11,450	599,475	662,605	9
10	Ferry	29	1,093	260	665	7	17	863	3,119	2,611	209,770	154,890	10
11	Franklin	16	540	31,150	62,311	148	753	3,092	7,771	1,682	232,207	165,188	11
12	Garfield	113	2,277	9,852	15,677	90	360	9,661	19,508	3,429	389,392	375,060	12
13	Grant	86	1,874	38,830	64,434	157	522	5,973	13,068	6,114	498,886	487,120	13
14	Grays Harbor	205	5,380	1,095	2,705	6	60	2,183	8,590	3,835	304,805	274,758	14
15	Island	40	1,260	1,497	2,950	.....	.....	685	2,945	7,885	128,805	104,522	15
16	Jefferson	77	2,250	114	222	226	523	209	1,518	989	84,029	85,872	16
17	King	608	30,177	1,676	7,727	633	4,317	4,249	29,311	49,990	1,669,687	1,421,617	17
18	Kitsap	76	1,920	279	613	9	44	848	3,910	31,074	169,521	100,449	18
19	Kittitas	243	7,545	38,656	76,895	194	970	5,617	17,150	870	648,475	604,775	19
20	Klickitat	151	1,973	45,068	50,373	416	870	13,762	15,045	3,958	277,397	461,856	20
21	Lewis	331	7,962	2,586	4,900	9	24	4,315	18,089	25,778	733,695	596,798	21
22	Lincoln	142	3,795	1,632	3,285	212	905	6,638	22,625	9,345	1,307,020	1,279,410	22
23	Mason	61	2,190	256	622	21	34	329	1,562	7,988	101,828	84,598	23
24	Okanogan	364	13,240	6,087	15,315	147	515	6,240	19,820	855	989,790	682,842	24
25	Pacific	123	2,737	123	162	.....	.....	361	1,598	1,194	127,417	61,584	25
26	Pend Oreille	44	1,049	164	325	51	127	563	1,818	1,688	86,880	95,028	26
27	Pierce	219	8,764	1,078	2,606	139	1,080	3,196	18,150	80,271	735,911	716,188	27
28	San Juan	78	1,255	5,666	13,790	10	100	448	2,760	2,330	133,560	122,280	28
29	Skagit	406	7,545	947	895	20	90	1,277	4,605	2,190	425,790	352,495	29
30	Skamania	38	805	169	190	.....	.....	229	773	340	32,026	52,010	30
31	Snohomish	511	11,050	367	1,055	104	345	2,194	10,850	23,940	712,895	625,960	31
32	Spokane	327	7,490	850	1,745	167	435	8,259	38,080	42,185	1,160,025	1,328,670	32
33	Stevens	181	3,270	4,092	7,623	.....	.....	.....	15,923	8,543	456,589	461,305	33
34	Thurston	228	5,260	1,269	2,253	118	320	2,773	9,551	12,381	351,277	386,582	34
35	Wahkiakum	75	1,472	104	122	.....	.....	478	1,597	1,056	67,529	71,499	35
36	Walla Walla	163	4,585	31,580	79,150	117	725	7,955	31,450	10,605	935,920	846,015	36
37	Whatcom	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	37

[illegible]

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STATE OF WASHINGTON

DEPARTMENT OF STATE

THE FISHERIES

OF THE

STATE OF WASHINGTON

By L. H. DARWIN,

State Fish Commissioner
State Game Warden

Issued by the

State Bureau of Statistics amd Immigration

I. M. HOWELL, Sec'y of State, Ex-Officio Commissioner

HARRY F. GILES, Deputy Commissioner

OLYMPIA, WASH.
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1916

Traps in the Columbia River and on Puget Sound take salmon by the hundreds of thousands. A steam brailer is used to remove the fish from the traps into scows, which convey them to the canneries.

THE FISHERIES OF THE STATE OF WASHINGTON

Value of Output.

Washington's fisheries resources are the greatest of all states in the Union and also the best fish, species for species, because the Pacific Ocean of which the waters of the State are tributary, is classed as a cold water, while the Atlantic is a warm water ocean.

The fishing industry in this state stands third, being outranked only by agriculture and lumbering. And what a vast resource it is may be ascertained from the incomplete figures compiled by the State Fish Commissioner's office for the year 1913, which was the year of the quadrennial sockeye salmon run. Under the law, as it existed at that time, only partial reports were made to the Fish Commissioner's office, but these reports, incomplete as they were, showed the value of the canned salmon product alone was $12,937,-006.78, while the value of the other salmon fisheries reported increased the grand total to $15,215,674.73.

No record is obtainable of the value of the other fish, but it is safe to say that in 1913 the total value of the output of Washington's varieties of food fish and shell fish reached a grand total of $20,000,-000.00.

In 1914 the figures were as incomplete as in 1913, but in that year the value, as far as figures were obtainable was $8,168,264.46 while the total was undoubtedly about $14,000,000.00.

Leading Species.

To date the identity of 180 salt water and 30 fresh water species, or 210 in all, has been established in the waters of this state. Of these 50 salt water and 6 fresh water varieties, or 56 in all, are edible. At the head of the list stands the salmon. The principal species are Chinook, also known as Springs, Tyees, Blackmouth or King; the Sockeye, the Silverside, the Humpback, the Chum or Dog as it is often locally called, and the Steelhead.

The choicest of the varieties canned, and on an average possibly the largest quantity, are the Chinook and Sockeye. These are the red salmon. Following them come the Silverside, which is medium red, and Humpback which is known as pink salmon; while the Chum or Dog demands the lowest price because of the fact that it is white meated.

As the Chum or Dog salmon is just as highly flavored and has all the food values possessed by the higher priced kind, the fact that it

does not command as high a price in the can as the Chinook, Sockeye or Humpback is because of the fact that the public was first educated to the red meated salmon.

The Steelhead, which is a deep pink, is mostly sold fresh, comparatively few being canned. It is classed by the U. S. Bureau of Fisheries as a trout. The average weight of a Steelhead is 11 pounds. They are iced and shipped fresh in enormous quantities to the Eastern markets where they command fancy prices. The Chinook salmon is also shipped fresh to the Eastern markets in large quantities. This variety is also what is called mild-cured and shipped to Germany and other foreign markets, where it is preserved by other processes and then disposed of at very high prices.

Value of Equipment.

On November 30, 1915, the date of the last report made to the Fish Commissioner's office, there were 56 canneries in the State of Washington, and according to these reports, the value of the plants and operating appliances was $5,317,753.72. The reports required by the fishing laws of the State do not furnish all the data as to the amount of money invested in the fisheries and fish taking appliances. However, it reaches a staggering sum. One of the items upon which no valuation is required by law is the purse seines. At this time there are some 300 in the State of Washington, and the average value of one of the boats equipped with seine is about $7,000, so that their total value would be $2,100,000.00. These boats are, in about 95 per cent. of the cases, owned by individual fishermen.

Then comes the boats and appliances owned by gill netters, traps, fish wheels, and scow wheels.

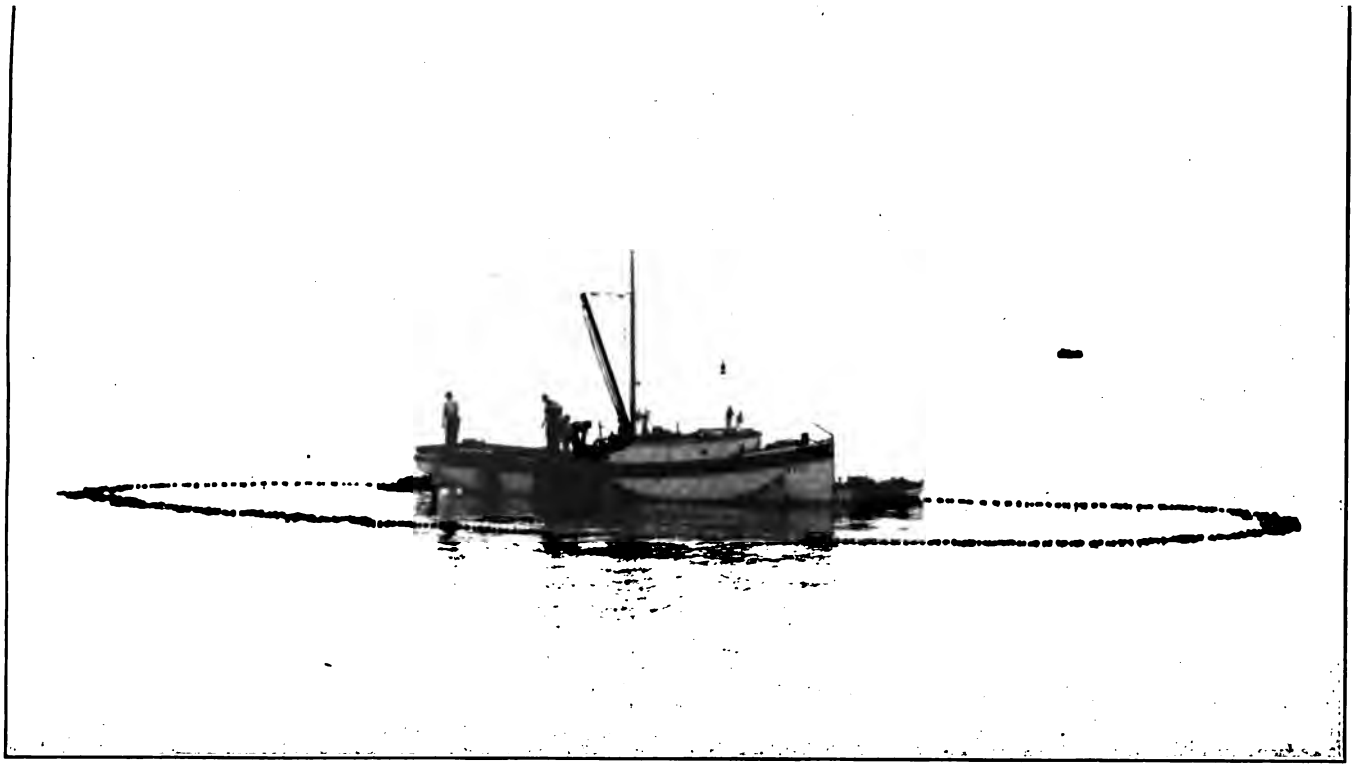
During the fiscal year of 1915, there were 610 fish trap licenses issued. Of this number 271 were in the Puget Sound District; 258 in Columbia River District; 50 in the Willapa Harbor District and 31 in the Grays Harbor district.

Cost of Trap Construction.

The expensive traps to construct are those on Puget Sound. All the traps for which licenses are issued are not constructed each year on Puget Sound. But about 80 per cent. of those licensed are constructed each year, while the law requires that in order to hold a location here a trap must be constructed at least every four years. Some of the traps on Puget Sound annually cost $14,000.00 and they are torn out at the end of the fishing season, only to be put in again the next year. It is safe to say that there is no trap on Puget Sound which costs less than $5,000.00 to construct each year. The fish traps on Columbia River, Grays Harbor and Willapa Harbor are much cheaper. In these districts they must be constructed every two years or the ownership is forfeited.

Principal Salmon Runs.

The principal salmon run of the Columbia River is the Chinook. There are also some Silverside, Steelhead and Blueback or Sockeye



The purse seine has revolutionized salmon fishing in Washington. This picture shows a purse seine "laid out." The average purse seine boat represents an investment of about $7,000.

taken in this river, but not in quantities to permit their pack to any thing like the extent that the Chinook are canned. In a commercial way, the Columbia River Chinook has for a number of years held supremacy but in the last few years the Puget Sound Sockeye has been gaining in favor so fast that the price of the Columbia River Chinook and the Puget Sound Sockeye is now about the same.

International Dispute.

On Puget Sound the Sockeye salmon holds the favorite place. Once every four years they run in enormous quantities. Their native stream is the Fraser River, in the tributaries of which it is safe to say 98 per cent. of the Sockeye caught on Puget Sound are hatched. All the salmon species return to the streams in which they were hatched, or at least to streams in the vicinity of those in which they were hatched. The returning Sockeye in attempting to reach the Fraser River, first passes through American waters, and the American fisherman is thus given first chance at them. This has been a source of great friction between the fishing industries of British Columbia and the State of Washington. As this friction intensified, it grew to International importance and an attempt to adjust matters was made by a joint high commission, appointed by the United States and the Dominion of Canada Governments four or five years since. The treaty adjusted all the fishery disputes between the two governments from the Atlantic to the Pacific Coasts. It was ratified by the Canadian Government, and was first ratified by the American Senate, but Congress afterwards refused to pass the necessary laws to make it effective and it has since been rejected by the Canadian Government. As a result of the failure to reach an agreement, the Canadian Government has withdrawn nearly all fishing restrictions on the Fraser River, with the full knowledge that this action will permit the rapid extinction of the Sockeye run.

Experimenting to Increase Sockeye Run.

With the adoption of this destructive policy by the Canadian (British Columbia) Government last year, the Fisheries Department of the State of Washington started experimenting, trying to hatch Sockeye salmon on the American side. The only American stream which the Sockeye enters is the Skagit River, up which possibly 2 per cent. of them ascend. The Fisheries Department of the State started in by taking Sockeye salmon from traps situated from 14 to 15 miles distant from the Samish River, on which the State of Washington has a large hatchery, and towing these fish in live boxes to the mouth of this river where they were liberated into the stream across which a rack or fence was constructed, to prevent their returning to salt water. The result of the fisheries arrangements, despite adverse climatic conditions, was highly satisfactory, more than 1,000,000 fish being hatched from the eggs taken from the fish conveyed to the Samish river the first year.

This year the experiment is being repeated on a larger scale, and it is believed that twice as many eggs will be hatched as last. If

this year's experiments are proportionally successful as last year's, the Fisheries Department of this State will definitely enter upon the work of trying to hatch Sockeye in much larger quantities. It is immaterial whether or not by this method the Department is enabled to establish a run of the Sockeye in American streams, for the eggs can be secured each year in the same manner in which they were first obtained and the work will go on just the same, and whether or not the fish return to the American stream or Fraser river, matters not, for in any event the fish first enter American waters and give American fishermen first opportunity to take them.

Life of the Salmon.

The life of the different salmon species varies. The so-called Chinook of the Columbia River, which is also called the Spring, King, or Tyee on Puget Sound, and Blackmouth or Tyee on Willapa Harbor is one especially which seems to have a varying age of from four to in some instances six and one half years. Undoubtedly the big majority of them return at the age of four years. The Sockeye on the other hand is classed as a straight four year old fish, as is the Silverside and the Chum or Dog. The Humpback obtains his majority and returns in two years. Of the above mentioned species (Chinook, Sockeye, Silverside, Chum, Humpback) die within a day or two after spawning. The only other species of salmon found in Washington waters is the Steelhead, which the Government calls a trout. This species does not die at the time of spawning, and as far as is known has no age limit, and in speaking of species of salmon it must be borne in mind that there are undoubtedly several varieties of Chinook, and this is true of the Sockeye, which in some localities, notably Grays Harbor, are called Quinault and in the Columbia River Blueback. The different members may vary slightly, but they all belong to the same general family.

Dr. Gilbert of Stanford University, possibly the leading authority of the life and habits of the Sockeye salmon has expressed the opinion that likely Puget Sound and the country northward to Alaska offers the best opportunity on the face of the known world for the maintenance of the fish supply. This is because of the fact that all species of salmon hatched in fresh waters make their way rather young to salt water, and return to their parent stream to deposit their spawn there, themselves dying in turn; for the salmon is one of the few members of the animal family that cannot beget without ceasing. It is the opinion of many practical hatcherymen that nature, by causing the death of the parent fish at the time of the spawning thus provides a food supply for the young salmon when they are born. The spawning salmon make their way up the fresh water streams to gravel beds where the female scoops out a round hole in the gravel in which she deposits her eggs. The salmon are monogamous, pairing off after they attain the spawning grounds. So it is that the egg of the female is immediately fertilized by the male swimming alongside, then the male fills the hole with gravel which the female has scooped out,

thus covering the eggs; this to prevent the trout and other fish which follow the salmon up stream from devouring then. Nature allows the parents to survive for two or three days during which time they hover over the spot where the female has deposited her eggs, and then they gradually weaken, float down stream a short distance and die.

State Hatcheries.

To maintain the enormous supply of food and game fish the State of Washington maintains or will be maintaining by the close of the fiscal year of 1916, a grand total of 33 hatcheries or as many in number lacking one as are maintained by the United States Government. Of this number 26 are classed as salmon hatcheries and 7 as trout hatcheries, but quite a few of the salmon hatcheries are used for hatching trout as well as salmon, and vice versa—a number of trout hatcheries are used to hatch salmon as well as trout.

The laws of Washington divide the state into four fishing districts; known respectively as Puget Sound, Columbia River, Grays Harbor and Willapa Harbor. The largest of these districts is Puget Sound, which contains from 75 per cent. to 80 per cent. of our fisheries resources. Following this, comes the Columbia River, containing some 15 per cent., while Grays Harbor and Willapa Harbor districts make up the remainder.

Of the 26 salmon hatcheries 16 are located in the Puget Sound district; these are Dungeness, Elwha, Green River, Green River Eyeing Station, Nisqually, Nooksack, Middle Fork Nooksack, South Fork Nooksack, Pilchuck, Chambers Creek, Samish, Skagit, Skokomish, Snohomish, Startup and Stillaguamish; 6 are situated in the Columbia River district, namely: Chinook, Kalama, Lewis River, Paterson-Methow, Wenatchee, Wind River, two in Grays Harbor district, Chehalis and Humptulips, and 2 in Willapa Harbor district, Willapa and North River. Of the total of 26 salmon hatcheries at this time, 10 have been constructed within the last three years. In addition to the construction of these ten new hatcheries during this period, the capacity of one of the other hatcheries has been increased five fold, another four fold and another three fold, while the capacity of many of the other hatcheries has been doubled or increased considerably over what it was prior to three years ago.

As a result, the hatcheries of the State of Washington, which during the season of 1911-1912 had a take of 77,900,000 eggs, during the season of 1915-1916 had a take of 158,400,000 eggs. In short, in the three years the take of the Washington salmon hatcheries has been more than doubled. The straight trout hatcheries number 7, and are known as the Lake Chelan, the Spokane, the Little Spokane, and the Walla Walla, Lewis River, Tilton River and Lake Crescent. Four of these seven have been constructed during the last three years, while the take of the trout eggs, which in the season of 1911-1912 was in round numbers 2,900,000, has increased during the season of 1915-1916 to over 17,000,000.

During the season of 1911-1912, it is estimated that it cost the

During the sockeye and humpback salmon fishing season the San Juan Islands present scores of scenes like this. More than three hundred purse seine boats and several hundred gill net boats find safe harbors almost anywhere among these islands.

State 88 8-10 cents per thousand to hatch salmon eggs, while during the season of 1915-1916, the cost will not exceed 30 cents per thousand.

United States Hatcheries.

While the exact figures of what it cost the United States Government to hatch salmon eggs in the State of Washington are not available, enough is known to warrant the assertion that it costs the Federal Government many times as much as it does the State, and this is one of the many reasons why the State has always opposed any action looking to the Federal Government taking over control of its fisheries. The United States Government at this time maintains five or more salmon hatcheries in this state.

It is estimated that in the State of Washington there are in the neighborhood of 60,000 people directly or indirectly dependent upon the fishing industry for their livelihood. The number has been rapidly increasing during the last 15 years.

Hatcheries Increase Salmon Run.

The ability to not only maintain but restore and in all likelihood increase the salmon run in some of the waters of the State has been absolutely demonstrated in the last few years. Notably has this been done in the Columbia River. For some 10 or 15 years the number of fish taken in this stream gradually decreased, owing to the extensive fishing operations carried on. However, the result of the establishment of hatcheries was first discernable three years ago (1913-14) when the run was larger than for several preceding years. The run in 1914-15 was the largest which had appeared in the Columbia River in 15 years, while as this is written the season of 1915-16 is at its height with indications that despite the most abnormal climatic conditions which have been known in more than 25 years the number of fish entering the Columbia River this season will be almost as large as the great run of 1914-15.

Fishermen regard the Columbia River now as a restored stream.

The Fisheries Department of Washington feeling that the world conditions of the last two years means that the people must look to the waters for their meat supply more than ever before will not rest content with simply restoring the depleted salmon runs in the Washington streams, but are trying to go further, and have intensive cultivation of the sea as there is today in many places intensive cultivation of the land.

Edible Varieties.

Because of the richness of our fishery resource, some varieties of fish which are used in the East are hardly classed as a table fish in Washington. Some Halibut and quite a few Sturgeon are in Washington waters, while smelt and herring abound. The Shad and Cod are taken in goodly quantities, as are Sole and Flounders. Salt water Perch also abound. The above mentioned fish are all present in large commercial quantities, and within the last few years the presence of certain Asiatic and European peoples have created a

great demand for the devil fish, which is highly regarded by them as a food fish. These same people also make use of Carp. Carp were introduced in some of the waters in this State 15 or 20 years since, and have thrived to the point where the Fisheries Department for the last few years is encouraging their destruction.

All the above named varieties of fish maintain their supply naturally—the State devoting itself exclusively to the propagation of salmon among the food fish and trout among the game fish.

Clam Fisheries.

In the matter of shell fish, Washington enjoys a unique distinction for our oyster (particularly the Puget Sound) small though they be, are the highest priced of any oyster produced on the American continent, while the Washington clam and crab enjoy the same distinction. Of the shell fish variety our clams lead in value of output as well as volume. Next to the Washington salmon clams are put into cans more extensively than any other variety of fish.

During the present fiscal year, licenses have been issued to 6 clam canneries in this State.

During the fiscal year ending November 1, 1915, there were 23,896 cases of clams packed in Washington, with a value of $143,376.00.

While there are many varieties, the leading ones are known as the Razor clams, found only on the Pacific Ocean Beach, and the Puget Sound clam, which abounds in the inland salt waters of the State. The Pacific Ocean clam has a pure white meat and a delicacy of flavor that makes it the highest priced on the market.

Oyster Fisheries.

The Puget Sound oyster, which is hermaphrodite, as distinguished from the bisexual Atlantic Coast oyster, is much smaller than the average Eastern variety, but is also much firmer and more toothsome.

Formerly they grew in large quantities in natural beds. Before the State got around to preserving these natural beds, many of the choicest of them had been taken up by individuals whose title thereto has been confirmed. However, some 14,000 acres of land have been withdrawn for oyster reserve purposes, either because at the time, or prior to their withdrawal they had been natural oyster beds or it was believed at a future time they would become such. For many years so great was the supply that small attention was given them, with the result that by 1913, the State Reserves had been almost depleted.

While the State has been negligent on Puget Sound, many private owners have not been, but have prepared their land for intensive oyster cultivation, by diking and grading.

The theory of holding the State's natural oyster grounds is to insure a seed supply to the growers at a nominal price. Consequently the State in 1913 started to follow the example of the private indi-

Oyster culture is rapidly increasing in importance in the State of Washington.

viduals and commenced diking the first of their natural reserves on Puget Sound.

The first one to be improved was part of what is known as the Hammersly Reserve, where ten acres have been graded and diked at a cost of $9,000.

The second improvement undertaken by the State is now under way at what is known as the Clifton Reserve where in the neighborhood of 6 acres will be graded and diked by September 11, 1916. It is believed that within two years, with only these 16 acres improved, out of 14,000, the revenue derived from the oyster reserves will make the industry self supporting.

The new law passed in 1915 will permit of the development of the State Reserves just as though they were owned by private individuals. If it is the desire of the State, the funds are already provided, under the law, whereby it will be possible to improve many acres of these reserves (which under our laws are reserved from sale or lease) in the succeeding years, and they can be made to yield the State a large revenue, if such is deemed the best policy.

The principal oyster beds on Puget Sound are found in Thurston and Mason counties; in fact, to such an extent do they lie in this vicinity that the Puget Sound oyster is generally known as the Olympia oyster, and Olympia, the capital city of this State, is the center of the business.

Privately cultivated beds are also found in Whatcom and Skagit counties, and some in Jefferson county.

There were marketed during the year ending March 31, 1915, from the Puget Sound district, 112,853 sacks of native oysters, worth $814,033.40, from 547½ acres; and 3,224 boxes of eastern oysters, worth $22,175.90, from 85 acres. During the same period the Willapa Harbor district produced 1,200 sacks of native oysters worth $8,400.00, from 2,200 acres; and 8,000 boxes of eastern oysters worth $56,000.00, from 1,500 acres. This represents a total yield of oysters amounting in value to $900,609.30, from lands worth $1,199,125.

The shell of the Willapa Harbor oyster is much larger than that of the Puget Sound. Some ten years ago the first attempt was made to transplant Eastern oysters to the Pacific Coast.

While the transplanted oysters would thrive and grow to a much larger size than if they had been permitted to remain in their native waters, it came to be the generally accepted belief that they would not propagate in Pacific Ocean waters. The conditions for oyster culture on Willapa Harbor is not nearly so favorable as on Puget Sound for the reason that this inlet is much nearer the ocean and the severe storms shift the sands so that diking, which has solved the situation on Puget Sound by preventing the exposure of the oyster to the heat of the summers and the cold of the winters, is not advisable on Willapa Harbor because the sand would readily fill in behind them. During the last year the state has attempted to assist nature on Willapa Harbor, by cutting the grass on natural beds and by reculching them, and also by the use of what is known as "agi-

tators." These take the slime from the shells leaving them rougher and therefore better spat catchers.

In the summer of 1915, Trevor Kincaid, professor of biology at the University of Washington discovered that in one of the favored spots in Willapa Harbor Eastern oysters were propagating naturally. Since that time investigations made by the fisheries department have disclosed the fact that there is considerable area on Willapa Harbor where the Eastern oyster has reproduced, and during June and July, 1916, the Eastern oysters which had been propagated on one of the State's Reserves were moved to a more favored locality in the hope that they had become sufficiently acclimated so that the area in which they would reproduce would be enlarged by their removal and replanting.

Crab Fisheries.

Of the shell fish, the future of the crab is the most promising, and is one of the future propagation tasks of the Fisheries Department. In places where they formerly abounded on Puget Sound they are now found in much fewer numbers. The great majority of crabs secured today in the State of Washington are along the Pacific Ocean shores in Grays Harbor, and Pacific counties. Of all those who make their livelihood from the sea the occupation of the crab fishermen is the most dangerous. His activities and exertions for the most part are around the mouth of the Columbia River, and the entrances of Willapa and Grays Harbor, and just inside the ocean's break. The best known is called the Dungeness Crab.

The Game Fish of Washington.

The choicest varieties to be found here are those which are native to Washington waters. They are the Cutthroat and the Rainbow and in almost as great a number is what is known as the Silver, which is, in reality, a land-locked Sockeye salmon. These are found in two of the lakes in this state which undoubtedly centuries ago had an outlet into salt water to which the salmon traveled. Some upheaval of the country cut this off for such a time that these fish lost their desire to go out to salt water. They die every four years just as do the Sockeye when they reproduce their species.

In addition to the native species of trout which are propagated extensively by the State, there has been introduced to our waters the Eastern Brook trout which thrived in some of the lakes of Eastern Washington, but does not seem to be able to survive in the waters of Western Washington. In addition to these are what are known as the Dolly Varden or Bull trout, which is the Pacific Coast equivalent of the Eastern Brook trout although as a rule he attains a larger growth than his Eastern brother, of the Char family. The native white fish is another most excellent table variety. Other varieties present in quantities are the Perch, Grayling, Crappie, Catfish, Bass, etc., etc.

The Fisheries Department of the State is the only one charged with the duty of maintaining an industry; reforestation has not yet been accepted as one of the State's prerogatives, but it is universally

conceded that the hatcheries of the State must annually produce their seed supply of young fish or the harvest two or four years later will be short just in proportion as a large or small crop is planted. During the height of the salmon hatching season, which is in the Fall and Winter, the Fisheries Department of the State employs more than 150 men. During the Summer, a large number of these men, including all of the hatchery superintendents are employed in the construction of new hatcheries and in the diking of oyster beds.

The Fisheries Department is also charged with the enforcing of all the laws of both food and game fish, for the State Fish Commissioner is also the State Game Warden. To aid in the enforcement of these laws the State maintains four patrol boats; two on Puget Sound, the "Governor Elisha P. Ferry," and the "Gov. John R. Rogers," one on the Columbia River, the "Governor John H. McGraw," and one on Grays Harbor. A fifth boat is maintained by the State the "Gov. Henry McBride," which is used in connection with the operations of the Lake Crescent Trout Hatchery.

Salmon Hatching.

The time which it takes a salmon egg to hatch varies according to the temperature of the water. The average time from the fertilization of the egg until it hatches, varies from 60 to 90 days. The usual period for the liberation of the salmon fry is the time when what is known as the eggsack is absorbed.

This egg sack is nature's food supply, and is gradually absorbed into and becomes the stomach of the salmon. It is generally from 30 to 60 days from the time the fish is hatched to the time this absorption has taken place, and until a few years ago, the rule in the Fisheries Department was to liberate the fry at this time. However, during the last few years the practice of feeding the young fry for several months instead of immediately turning them loose has been introduced and gradually enlarged until today at a majority of the hatcheries a goodly portion of the output is fed for a time before being liberated, on the theory that the older and larger fish is much more capable of protecting itself from its natural enemies than the younger fry. When the eggs are taken at the hatcheries from all those species save the Steelhead, the female is killed before the eggs are taken from her, and a portion of the bodies of the parent salmon are preserved in a mild salt solution and later on the flesh is freshened again, ground very fine and fed to the off-spring. In other words, the young fish are literally fed the bodies of their fathers and mothers.

The State Fisheries Exhibit.

The work of assembling this fisheries exhibit was begun some three years ago, and has been carried on steadily since.

It has been done without any direct appropriation made for the purpose, but the Department believed that the State will realize its value and the fact that it is symbolical of its third greatest industry, and will at no distant date make an appropriation that will permit of its enlargement so that it will contain species, either alive or still, of every variety of fish to be found in Washington waters.

The destination of many of the fish. A salmon cannery on Puget Sound.

1915

State of Washington

BUREAU OF STATISTICS AND IMMIGRATION
I. M. HOWELL
SECRETARY OF STATE, EX-OFFICIO COMMISSIONER

Homeseekers' Guide

TO THE

State of Washington

By HARRY F. GILES
Deputy Commissioner

OLYMPIA
FRANK M. LAMBORN PUBLIC PRINTER
1914

STATE OF WASHINGTON
DEPARTMENT OF STATE

Bureau of Statistics and Immigration

I. M. HOWELL, Secretary of State
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LETTER OF TRANSMITTAL.

OFFICE OF THE
BUREAU OF STATISTICS AND IMMIGRATION.
OLYMPIA, January 20, 1914.

Hon. I. M. Howell, Ex-Officio Commissioner:

SIR: Pursuant to your instructions, I have prepared and have the honor to transmit herewith a report describing in detail the counties, cities and towns of the State of Washington, and entitled the "Homeseekers' Guide." I recommend that an edition of 25,000 copies of this be published for general distribution in connection with the work of this Department.

Respectfully,

H. F. GILES,
Deputy Commissioner.

Approved for publication February 2, 1914.

I. M. HOWELL,
Ex-Officio Commissioner.

FOREWORD.

In exploiting the opportunities of a state so diversified in its resources as the State of Washington, much difficulty would be experienced by attempting to exhaust every important phase of the subject unless a book far more comprehensive than this publication were planned.

The wisdom of large volumes being doubtful, the policy of issuing a number of medium sized ones has been adopted. Each will discuss the advantages of the state from a different standpoint, or will take up some particular branch such as dairying, stock raising, hog raising, intensive farming, logged-off lands, irrigated lands, etc. Another will also be issued paying more attention to the state at large. Everything published will be for free distribution.

In this particular book, which is intended primarily as a guide for the homeseeker, no pictures are shown, as only by such elimination was it possible to hold to the present size without sacrificing some important detail of information. The way for a prospective settler to get the most out of it is to first read carefully the introduction and note in a general way the differences of the various parts of the state; then turn to the description of the group of counties which seem to attract him most. If more information than that contained herein is desired regarding any section, a prompt answer will be received by writing to any of the commercial bodies listed on page 108. This Department also is ready to answer all questions to the best of its ability and to assist anyone in getting the absolute facts regarding the conditions in any section of the state.

In compiling this book the Bureau is indebted to over one thousand contributors, including thirty-nine assessors, 200 secretaries of commercial or civil organizations, 700 postmasters and many other reliable men representing various walks of life, and properly informed regarding their respective communities. All facts have been carefully checked by representatives out in the field, and only such statements made as can be safely defended.

To all these contributors and coworkers, the utmost appreciation is expressed for the willing cooperation which they have so kindly given.

29 at Cle Elum. The soil is mainly a decomposed basalt and known as volcanic ash. It is rich in minerals, containing iron, lime, potash and phosphoric acid, in depth varying from one to one hundred feet. The higher portions are devoted chiefly to the raising of grain and this is the country that produces Washington's 50 million bushels of wheat, its 7 million bushels of barley, and a large portion of the 14 million bushels of oats. Washington produces more of oats to the acre than any other state and is excelled by one state only in the production of barley per acre.

IRRIGATED VALLEYS.

The valleys are generally irrigated and devoted to fruits, chiefly apples, peaches and pears, alfalfa, corn, vegetables, and hops. The larger portion of the $10,000,000.00 apple crop is at present produced in the Yakima and Wenatchee valleys, and their tributaries, the remainder being produced chiefly in Spokane and Okanogan counties, in the Walla Walla valley, and along the Columbia, the Snake, and a number of smaller streams affording irrigation. Spokane and Okanogan counties have about as many trees as Wenatchee and Yakima, but a comparatively small number have as yet come into bearing. Many higher areas produce excellent fruit under practically dry farming conditions. A good example is Klickitat county which has won several prizes for non-irrigated district displays. The raising of corn is a new industry but wherever tried it has met with eminent success. Nearly a million bushels were raised in 1913.
1913.

WESTERN WASHINGTON.

The chief features of Western Washington are the Olympic Mountains, enveloping the Olympic Peninsula; the lower Columbia region in the southwest; and the great Puget Sound basin, lying between the two ranges of mountains, towards which it rises by gentle slopes, and containing the inland sea, Puget Sound. Practically all parts were once covered with dense timber and there still remains some of the thickest bodies of timber to be found anywhere in the world. Part of the remainder, particularly that closest to the Sound and the rivers, has been cleared and placed under cultivation, while much more is in the so-called logged-off state. The country, other than the mountains, is made up of valleys, rolling hills, and level plateaus, nearly all of which is fit for agriculture in one form or another. The most prominent soils are clay and sandy loams, intermixed with much alluvial bottom lands, alder bottom and

beaver dams, while in some sections at the deltas of rivers are large areas of dyked tide lands very rich in soil elements. The chief agricultural products here are grasses, oats, root crops (especially potatoes), fruits and berries. For berries and soft fruits Western Washington is probably unexcelled by any part of the world. In certain sections hops and bulbs are specialties. It should be noted in passing that the average yield of hops per acre is greater than in any other state in the Union. It is one of the states that produces most of the hops of the country. The precipitation in all sections of Western Washington is sufficient so that no irrigation is actually needed, although in the case of some gravelly prairie land, as at Sequim or on the prairies of Pierce and Thurston counties, irrigation for a brief period has been found beneficial.

LIVESTOCK, DAIRYING AND POULTRY RAISING.

On account of the readiness with which grasses and root crops grow and because of the exceedingly mild winters enjoyed, nearly all parts of the state are particularly well adapted to the raising of beef cattle, hogs, dairy cows, and poultry. The imports into Washington of the products of these run high into the millions each year. Although they have been neglected in the past, partially on account of the daily attention required, and partially because the people have been too busy reaping easy harvests in other lines, these industries are promising now to yield splendid returns to any persons that like to care for animals. No enterprises in the state have greater possibilities. A complete pamphlet has been prepared on this subject and will be mailed free to any persons interested.

The sheep are raised chiefly in eastern Washington, pasturing in the summer on the foothills and wintering in the warm valleys. In western Washington a considerable number are raised on the San Juan Islands. In 1911, 400,000 sheep produced 3,700,000 lbs. of wool, and in 1912, 3,600,000 lbs., placing Washington first in the average weight per fleece which, in 1911, was 9.25 lbs., and in 1912, 9 lbs.

Horses and mules also do well in any part of the state. Goats are particularly adapted to the western counties.

The report of the state board of equalization for the year 1913 shows the following figures as representing the number and value of every kind of livestock assessed for taxable purposes. The actual value is based on the assessed valuation of 42.44%.

NUMBER AND VALUE OF LIVESTOCK AND POULTRY IN WASHINGTON FOR YEAR 1913.

(Taken from report of state board of equalization.)

	No.	*Assessed value*	*Actual value*
One year old horses.....	29,187	$479,512	$1,129,859
Two year old horses.....	25,161	661,155	1,557,858
Three year old horses.....	43,295	1,470,262	3,464,331
Work horses	159,279	8,398,202	19,788,412
Stallions	1,102	223,951	527,688
Mules and asses.....	13,963	702,086	1,654,302
Stock cattle	148,978	2,037,174	4,800,127
Milch cows	149,140	3,904,018	9,198,911
Bulls	5,148	130,049	306,430
Stock, sheep and goats.....	407,577	744,544	1,754,345
Sheep bucks for breeding...	5,208	19,630	46,254
Hogs	132,696	583,634	1,375,198
Poultry	.....	526,937	1,241,605
Total		$19,881,154	$46,845,320

CLIMATE.

Climate has been briefly discussed in connection with a number of the county descriptions. It might be added in general that in no part of Washington's habitable portions are there wide variations or extremes of temperature, either in summer or in winter. This equability is probably caused partially by the Japan current and the protection afforded by the mountains. Even during the months of July and August, those months that are the dread of so many people in other parts of the world, the temperature in Washington is still even and never excessive. Sunstroke has never been known and the evenings are always cool and conducive to sound slumber so that one awakes in the morning refreshed and ready for the day's work. The eastern Washington climate is considerably dryer than west of the Cascades, while the precipitation in the Puget Sound district is about the same as in the city of Chicago. The lowest precipitation in Western Washington is in the vicinity of Port Townsend and the highest out near the Pacific ocean. Very little snow falls, the precipitation being chiefly in the form of rain. The larger portion falls during the winter months.

The following table shows the precipitation at a few centrally located stations in Western Washington, for which data is complete for the past five years.

	1908	*1909*	*1910*	*1911*	*1912*
Port Townsend	16.21	18.06	17.40	17.59	19.91
Anacortes	27.90	27.50	28.21	25.93	29.42
Bellingham	25.80	28.89	36.97	30.59	27.42
Centralia	46.64	52.08	55.73	39.35	53.71
Olympia	53.20	61.24	62.96	39.39	59.56
Seattle	28.25	31.72	34.24	21.69	35.14
Tacoma	38.21	44.14	45.42	27.79	43.58
Vancouver	32.77	44.24	38.54	30.85	39.49

The annual normal temperature for western Washington, as deduced from a long period of years, is about 51 degrees; for the country in the vicinity of Spokane about 48 degrees, and near Walla Walla 53 degrees. The lowest monthly normal for the same period in the vicinity of Seattle is 39 degrees, near Spokane 27 degrees, and Walla Walla 33 degrees. The highest monthly normal near Seattle is 64 degrees, Spokane 69 degrees, Walla Walla 74 degrees.

The mean temperature in some localities for the year 1912:

	Lowest monthly.	*Highest monthly.*	*Annual.*
Western Washington:			
Aberdeen	40.9	60.4	49.8
Bellingham	39.4	64	51.2
Centralia	40.6	64	51
Olympia	40.6	63.8	50.7
Port Townsend	42	60.7	50.5
Seattle	41.6	63.4	51.5
Tacoma	40.6	63.2	50.9
Vancouver	40.4	66.8	52.8
Eastern Washington:			
Wenatchee (near)	24.1	68.2	47.2
North Yakima	26.6	71.2	50.8
Spokane	26.6	66.6	47.9
Walla Walla	31.2	72.6	53.1
Ellensburg	23	66.5	46.9
Omak	20	69.8	48.6

LUMBER.

The wonderful timber growth, already mentioned, supplies the material for the state's main industry outside of the agricultural and livestock pursuits. Lumber and shingles have been the principal manufactures for many years and probably will for many yet to come. For the past nine years Washington has lead all other states in these products. The yearly output is about 4,000,000,000 board feet, and represents in value 40% of all manufactures. The state has the largest shingle mills in the world and produces about two-thirds of all the shingles produced in the United States. About 1,500 establishments are engaged in these enterprises and employ about 50,000 men. There are altogether about 400 billion feet of timber yet remaining. Reforestation, however, is receiving some attention while a good healthy growth is now helping to make up for the amount cut each year. The principal trees are fir, cedar, hemlock, spruce and yellow pine, with some tamarac in the northeastern counties. By far the largest portion of the timber is in Western Washington, especially on the slopes of the Cascade and Olympic mountains.

The counties of Eastern Washington containing timber are the Okanogan highlands, already noted; the portion of the southeast

comprised by the Blue mountains; the northern part of Spokane county, and the eastern slope of the Cascades. Nearly all the remainder of eastern Washington in its primeval state was covered with sage brush and bunch grass.

OTHER MANUFACTURES.

Manufactures other than timber products include flour mill and grist mill products; slaughter house products; canned or preserved fruits, meats, fish, etc.; foundry and machine shop products; butter, cheese, condensed milk, etc.; the products of breweries; clay products, cement, etc. All manufactures in 1909 amounted to $220,746,000.00, representing a capital of $222,261,000.00, and employing 80,118 persons. For 1913 the total value would probably represent upwards of $300,000,000.00. The unlimited supply of raw material, together with vast water power and coal deposits, promises big possibilities for future development in all lines of manufacturing.

WATER POWER.

The department of engineering of the University of Washington estimates a maximum available water power from the main drainage areas in the state, not including the Snake river, as 13,125,000 H. P. There have thus far been developed only 227,000 H. P. for public service corporations and about 38,000 H. P. for commercial purposes.

WATER POWERS OF THE STATE OF WASHINGTON.

(From Preliminary & Reconnaissance Notes Prepared by the Department of Engineering of the University of Washington.)

Drainage Area.	*H. P. Entire 12 months at cost of $1.50 per H. P. or less.*	*H. P. Estimated average for year irrespective of distribution or cost.*
1. Cowlitz river	230,000	1,500,000
2. Toutle river	48,000	320,000
3. Lewis river	55,000	450,000
4. White Salmon river	60,000	220,000
5. Nisqually river	45,000	225,000
6. Puyallup river	40,000	175,000
7. White river	110,000	285,000
8. Cedar river	75,000	200,000
9. Snoqualmie river	100,000	400,000
10. Skykomish river	85,000	240,000
11. Stillaguamish river	50,000	220,000
12. Skagit river	250,000	1,200,000
13. Klickitat river	118,000	300,000
14. Chelan river	300,000	500,000
15. Spokane river	80,000	240,000
16. The Olympics	160,000	850,000
17. Columbia river (with tributaries not mentioned)	750,000	5,800,000
Total	2,556,000	13,125,000

SHIP BUILDING.

With the many miles of water front, on both salt and fresh water, together with the great lumber output, it readily follows that ship building must be an important industry. One of Uncle Sam's largest battle ships was built in Seattle and other craft are being built every year. This industry is carried on in the Puget Sound district, on Gray's Harbor, Willapa Harbor and along the Columbia river. The state industrial insurance commission reports 56 firms employing 1,255 men engaged in this enterprise.

MINING.

Mining is gradually assuming important dimensions. The leading product thus far is coal, the annual output of which is about 4,000,000 tons. If the estimate of the Conservation Commission is anywhere nearly true, then there is enough still buried to last at least 5,000 years longer. Forty-nine companies are engaged in this enterprise and employ 6,700 men. The leading counties are King, Pierce, Kittitas, Thurston and Lewis.

In metal mining, the state has barely made a start, but without doubt, Washington is destined some day to play a leading part in this important industry. The annual production of metal mines amounts to about $1,000,000.00. Gold leads, with silver, copper, lead and zinc following. There are seven smelters employing 881 men. The most productive gold mines at present are in the vicinity of Republic, Ferry county.

FISH.

The public has little idea of the magnitude of, and the money required to handle, the fish output of the state. First in importance is the salmon packing industry, which in 1911 amounted to $9,166,845.40. All other products including crabs, clams, fresh, salted and smoked fish, shell fish, oysters, oil, fertilizer, and glue, amounted to $4,307,233.00. The State Fish Commissioner's last biennial report shows the following for all fisheries:

	1911	*1912*
Working capital involved.....	$5,130,000.00	$3,940,450.00
Value of canneries, equipment, etc.	5,858,810.00	5,994,875.00
Total capitalization	$10,988,810.00	$9,935,325.00
No. of persons employed.....	13,577	12,206
Earnings of labor.....	$4,416,709.00	$3,797,865.13
Total value of output.....	$13,474,078.17	$7,964,346.62

The output for 1913 will probably amount to $15,000,000.00 or more.

The state owns and operates 10 trout hatcheries with an output of 4,399,050 trout, and 20 salmon hatcheries producing 116,463,550 salmon. These fish were planted in the several lakes throughout the state and in Puget Sound and other waters on the coast.

TRANSPORTATION AND COMMERCE.

The state has 6,750 miles of steam trackage, 979 miles of electric railway, and 39,062 miles of highway. The chief railroads are the Northern Pacific, the Great Northern, the Chicago, Milwaukee & St. Paul, the Oregon & Washington Railroad and Navigation Company, and the Seattle, Portland & Spokane. There are a number of smaller lines carrying passengers, also a number of logging roads. Various other companies which are mentioned in connection with the county and city descriptions, operate over these tracks.

There are also about 2,500 miles of salt water frontage and over 1,000 miles of navigable river besides several large lakes that assist materially in the transportation of the state's products. The imports for the Puget Sound district for the year ending June 30th, 1913, were $51,473,683.00. Exports for the same period were $62,382,922.00. The tonnage on the navigable rivers for 1910, not including the Columbia above the mouth of the Snake, was 7,240,250 tons.

EDUCATION.

Washington naturally boasts of its educational facilities. There are 2,654 school districts, each containing from one to seventy school buildings, from one to 33,000 pupils and employing from one to 1,016 teachers. There are 325 public high schools containing from 6 to 1,600 pupils, three state normals, one state university, one state agricultural college, and 120 private schools including Whitman College, Whitworth College and the University of Puget Sound. The Russell Sage Foundation places the state first in the entire list of 48 states, taking into consideration ten different tests of efficiency. In nearly all the public schools manual training, domestic science, agriculture, music, and art are taught. The U. S. census report shows that the state contains the smallest number of illiterates to the 1,000 of native born whites 21 years old and over, and is outdone by only two states in the number of illiterates per 1,000 for the entire population 10 years of age and over.

OTHER STATE INSTITUTIONS.

Washington has three hospitals for the insane and one for the feeble minded, a reformatory, a training school, a penitentiary, a school for the deaf and one for the blind, a State Soldiers' Home, and a Washington Veterans' Home. A state agricultural department is maintained for the help of farmers, while a number of counties have availed themselves of the law authorizing the employment of county agricultural experts. A state fair is held each year at North Yakima, and state aid is given to the Southwest Washington Fair in Lewis county. There are two large experiment stations, one at Pullman in connection with the State College, and one at Puyallup, also a number of smaller ones in various districts.

LANDS.

Of the state's total land area of 42,775,040 acres, 11,322,644 acres are included in forest reserves, and 2,949,037 in Indian reservations. The total area of surveyed state lands is 2,024,219.16 acres and of unreserved and unappropriated government lands 1,750,208 acres. Practically all the remainder, with the exception of a few thousand acres of military reservation, has passed into private ownership.

State lands will be put up at auction upon proper application to the Commissioner of Public Lands and will be sold to the highest bidder for 10% down, the rest in 9 annual payments and 6% interest on deferred payments.

Government lands for homesteading are obtained in the usual way, the applicant filing on any vacant piece and then making his home there for three years before obtaining a patent. The best of these have already been filed on. The larger portion which still remains outside of the reservations is in the eastern part of the state. The quantity remaining July 1, 1913, is mentioned in the paragraphs on "lands" in connection with the various county descriptions. The counties containing the largest areas of such lands are Yakima, Kittitas, Stevens, Okanogan, Pend Oreille, and Grant.

At quarterly intervals the lands of deceased Indians are put up at auction and sold by the Indian Agent of the reservation to the highest bidder. Pieces may also be leased for five-year periods.

Several million acres of excellent private lands are available to settlers at low prices and on reasonable terms. They include all classes of lands both improved and unimproved, but the best opportunities usually consist in buying and developing the rough lands. In Western Washington, with the exception of a limited amount of

prairie and tide lands, they are generally stump or logged-off areas. Much is owned by logging companies who, having cut off the marketable timber, are willing to let the lands go at very low prices to those wishing to develop and make their homes on them. In Eastern Washington, they consist of logged-off lands in the northeastern counties, irrigable lands in the river valleys, and dry farming lands on the higher plateaus. The completion of a number of important irrigation projects now under way will soon add vast areas to that already available for irrigation. There is also some suitable for grazing only. Not more than one-sixth of the state is improved, the remaining five-sixths holding splendid possibilities for agriculture in all branches.

PRICES.

Prices are discussed in connection with each county. It should, however, be stated that there is no more difficult subject on which to make a careful statement. In every case effort has been made to be as conservative as possible both as to maximum and as to minimum, trying to avoid extremes in either case. Prices of improved lands are more difficult to discuss than of unimproved, on account of the varied nature of the improvements. The highest priced land usually has high class improvements, including expensive buildings, etc. It can readily be understood that if the same buildings are on a few acres instead of a large farm, the apparent price per acre will be much higher. Values of orchard lands are affected by the age, kind and bearing ability of the trees. Nearness to market and other desirable features influence prices here as in other states. It should also be noted that the lowest priced land is not always the cheapest in the long run. Much depends on what it will do, and its desirable location as a place for a home.

SEE FOR YOURSELF.

No matter where one intends to buy land, he should first see it himself. The greatest danger in making a mistake comes from buying at a distance. Lands in the same neighborhood are often very unlike. It will pay to see the place where one contemplates making a permanent home before investing any money. The purchaser will then be more satisfied with the choice. This Bureau stands ready to render any possible assistance that will lead a person to discover the exact locality he would prefer. When every proper precaution has been taken, the newcomer seldom has any longing for the old home he left when taking the step that started him toward the great and welcoming State of Washington.

THE STATE BY COUNTIES.

SOURCES OF INFORMATION.

1. The figures representing the area of unreserved and unappropriated Federal lands were taken from Circular No. 259, issued July 1, 1913, by the General Land Office of the Department of the Interior.

2. Figures representing state lands were taken from the last biennial report of the Commissioner of Public Lands issued September 30, 1912.

3. Two population figures are given for each town: 1st, the U. S. census for 1910, and 2nd, the local estimate as made by authority in each community. This Bureau assumes no responsibility for these estimates. They are given here as interesting data showing the probable growth which has taken place in the various communities since April 1st, 1910.

4. The elevation figures were supplied by an official in each community.

5. The arrangement of counties according to location is partially arbitrary as several counties could be easily classed with either of two groups and a number are difficult to classify at all. It is felt, however, that this plan is a natural one and will assist the reader in getting a comprehensive view of any particular section of the state. By reading in the order given, one can imagine a trip about the state.

6. For further information write to the secretary of any commercial body (see page 108), or to the

STATE BUREAU OF STATISTICS & IMMIGRATION,
OLYMPIA, WASHINGTON.

PUGET SOUND GROUP.

SAN JUAN COUNTY.

San Juan county consists of the group of 132 islands lying between the Strait of Juan de Fuca and the Gulf of Georgia. It is the smallest county in the state and contains 178 square miles. On one of these islands (San Juan) the British flag last floated as the emblem of English authority within the territorial limits of the United States. The principal islands besides San Juan of 54.7 sq. miles, are Orcas, 57.7 sq. miles, and Lopez 40 sq. miles. These contain more than three-fourths of the population and most of the land area of the county. Other islands supporting prosperous communities are Shaw, Waldron, Stuart, Blakely, and Decator, while a number of still smaller ones are inhabited. No region of the world presents more entrancing loveliness than do these verdure clad, deeply indented, agate beached gems of Puget Sound. Already many wealthy men are selecting the beautiful coves and improving them with the comforts and conveniences of retiring life. Through the deep water passages throng and sport myriads of salmon during the last days before making for the spawning grounds in the mainland rivers.

Topography: The islands present various topographical features. With deep indentations, the shores in some places rise in gradual slopes affording considerable area for cultivation and in others with sheer cliffs from the water's edge to the timber crowned summits. On Orcas rears Mt. Constitution with its final elevation of 2,428 feet, reached by a picturesquely winding public road, skirting beautiful lakes and fertile valleys. Other low mountains are to be found on the larger islands, the agricultural areas being found in the valleys between.

Population: The 1910 census gave 3,610, that of 1900, 2,928, showing an increase of 23 per cent. Most of the people are of sturdy American stock but the preponderating industry of fishing has attracted many Norsemen and some Icelanders, Germans and Canadians.

Lands and Soil: Between the mountain heights are many little valleys containing good agricultural land, nearly all privately owned and gradually being cleared for culture. Some of it is excellent grain land and all of

it the very best for orchard and truck farming. The total area of the county is 113,920 acres, of which 3,472 acres are state lands. The soil is mostly a rich calcareous brown loam, rich in phosphates, these ingredients being added from the decomposing limestone cliffs, ocean vegetation and forest droppings. Portions of each section are rich beaver dam lands, bottom lands, and prairie lands.

Climate: The western slope of San Juan is more exposed to the outer ocean blasts, but the eastern slope, protected by the high hills, and the inner islands shielded by San Juan and washed by the warm Japan current enjoy unusually pleasant climatic conditions the year round. The mean annual temperature is about 48 degrees, the average daily variation being about 25 degrees. The annual precipitation is 30 inches, divided into 6 inches in the spring, 12 inches in the winter, 3 in summer and 10 in the fall. Contrary to what might be expected from such a situation, there is not much fog on the islands themselves although there is considerable on the surrounding waters.

Prices of Land: Tracts suitable for miscellaneous farming, dairying, stock raising, fruit growing, etc., can be obtained at from $10.00 to $100.00 per acre, while beautiful nooks, containing a little arable land and suitable for summer retreats or permanent retirement can be acquired at small cost.

Natural Resources: The immense lime deposits, some of which run almost chemically pure, afford the largest revenue in manufacturing. The Roche Harbor Lime Company on San Juan operates 13 kilns with a capacity of 1,500 barrels daily. This is a perfectly equipped plant making its own packages and with wharfage facilities for direct shipping to world-wide markets. Other smaller plants on this and Orcas islands are also in operation. The most valuable salmon traps are among these islands and support extensive canneries, while crab and clam products are canned at Friday Harbor. Veins of gold, silver, and copper are uncovered, but little mining so far has been done.

It produces more sheep than any county in Western Washington. Cattle, poultry, and dairying are also profitable pursuits. The region is famous for apples and produces other fruit and berries successfully. Considerable hay is exported. Plenty of pure, clear running water is obtained from small streams, springs and wells.

Transportation: A number of passenger and freight steamers as well as several commodious launches ply these waters daily, touching every nearby town and village and affording cheap transportation to the main land cities. The waters are thronged with fishing vessels and the world's commerce passes near its southern and western shores.

Wages: Laborers are always in demand and they obtain good wages. At harvest time and during the fishing season common labor is paid $2.50 to $3.00 a day. Berry and fruit pickers receive from $1.50 to $2.00 and mechanics $4.00 to $7.00.

Social Conditions: The islands are used as the play grounds and summer retreats of the people of Puget Sound. At Rosario, on Orcas island, is one of the most extensive private estates on the Pacific coast. Within the music hall of its fire proof mansion is a pipe organ said to have cost $25,000. An esthetic and convivial hospitality abounds. Schools and churches are ample in number. There are 27 school districts, 19 postoffices and 3 rural mail routes.

CITIES AND TOWNS.

The only incorporated town is Friday Harbor on San Juan. The other principal towns are Roche Harbor, East Sound and Orcas on Orcas Island, and Richardson on Lopez.

Friday Harbor: County seat. Altitude 75 feet. Population (1910 census) 400. Local estimate 500. A fishing and farming center and the home of the Biological Station of the University of Washington. It has a United States Custom House, two salmon canneries, two newspapers, a bank, a new fire proof court house, electric lights and volunteer fire department. Two churches and good schools are maintained, including a four-year high school. Four Sound boats stop daily.

Roche Harbor: Population 250 (local estimate). Principal industry is lime manufacturing. It has extensive kilns and exports products to all Pacific coast points. Its lime works are probably the greatest in the west. It also has a stave and heading mill, stone quarries and cooper shop. Farming, horticulture and fishing will in time be important. Satisfactory steamboat transportation is supplied.

ISLAND COUNTY.

This county consists of two large and two very small islands composing 208 square miles of land lying out in the waters of Puget Sound. The two largest are Whidby and Camano. The first of these, often called the long island of Puget Sound, is about 50 miles long and from 2 to 9 miles in width. The other is about 20 miles in length and from 1 to 7 miles wide. It is connected with the mainland by a bridge at Stanwood. Both islands are deeply indented with bays forming beautiful harbors and fine shelving pebbly beaches. The country is usually quite level although slightly rolling in places. There are no rivers nor mountains but a few small creeks and pretty lakes. A portion of the western slope of Whidby faces the Strait of Juan de Fuca and attracts many campers on account of the ocean breezes. The other portions of the county face the calm waters of the Sound.

Lands: The total area is 133,120 acres, most of which has passed into private ownership, there being only 6,453 acres owned by the state and no unappropriated federal lands. The central portion of Whidby is gently rolling prairie and contains the bulk of the agricultural lands, 15,000 acres of which are under cultivation. A still larger area is in the logged-off or partially cleared, and presents many excellent opportunities.

Soils: The soil is clay loam enriched by centuries of decaying vegetation. On most of the level land it is very rich and highly productive, especially for cereals, hay, vegetables or fruit. Phenomenal crops of wheat, oats and hay have been produced here and the soil is well adapted for truck farming. One acre near Coupeville produced one hundred and seventeen bushels of wheat.

Climate: The annual precipitation is the lightest on the Sound. Snow seldom falls and fogs are uncommon. In 1908 there were 16.60 inches of rain fall equally distributed throughout the year except that the least precipitation was in July and September. The mean temperature averaged 49.65. There is scarcely any freezing weather and the temperature in the summer is seldom warmer than 80 above, the air being tempered at all times by the warm ocean tides and land breezes.

Prices of Land: Some wild land is for sale at from $15.00 to $20.00 per acre. Much of this, when cleared, will be worth as much as the best now occupied. Improved agricultural land is well worth from $50.00 to $150.00 per acre since the best of it will yield 75 to 150 bushels of oats, 3 to 8 tons of potatoes and 2 to 2½ tons of timothy and clover per acre.

Resources and Industries: There is no mining and comparatively little manufacturing in the county, the chief resource being dairying and fruit and vegetable raising. Valuable fish traps line its seaward shores and give considerable employment to the local people. The county needs, and offers favorable inducements for, the location of fruit canneries and creameries and would like a condensery, also an electric lighting plant which would furnish power. Many of the towns have their own water systems, while fine springs and small creeks are everywhere and shallow wells can be easily obtained.

Transportation: Steamboats give daily service between all landings and to Everett and Seattle. Good wagon roads traverse the county and efforts are being made toward getting state assistance for a bridge over Deception Pass, which is at present crossed by a ferry.

Markets: Every product of the county will find a ready market at Everett or Seattle and this would be true so far as dairy products go if the quantity were increased many fold.

Wages: More people than are permanently resident are needed at harvest and fruit picking time and even better wages than on the mainland prevail. Skilled mechanics in limited numbers will be encouraged to make their homes in this county where good pay is given for expert work and every chance exists for accumulating a competence in property and permanent assets.

Social Conditions: There are so many pretty villages and comfortable homes in intimate association that the communities are much like a happy family in their relations. This brings about a delightful feeling of hospitality and mutual helpfulness. Each neighborhood has its pretty school and homelike church. A county fair is held each year and the summer resorts are attractive to campers for many months. Nearly all homes are connected by telephone service. There are 16 school districts and 15 postoffices.

CITIES AND TOWNS.

Coupeville: Population 1910, 310. Local estimate 350. County seat. The metropolis of the county and one of the oldest settlements in the state. It has a saw mill, weekly newspaper, two churches, and a four-year high school attended by pupils from all over the north end of the island. Near by is Still's Park, a pretty summer resort. Surrounding the city are some very fertile agricultural lands. Daily boats connect with Seattle and Everett.

Langley: Population 350 (local estimate). A farming center known as the metropolis of the southern end of Whidby island. Agriculture and timbering are chief industries. It has a cannery, two churches, a two-year high school, and one newspaper. There are four boats daily to Seattle.

Oak Harbor: Altitude 30 to 150 feet. Population (local estimate) 500. A farming and saw mill town on the north end of Whidby island. It has good school facilities and one weekly newspaper. Daily boats to Seattle and Everett.

Other centers are Classic, Mabana, Maxwelton, Clinton, San de Fuca, and West Beach.

WHATCOM COUNTY.

This is the extreme northwestern county in the United States. It is bounded by British Columbia on the north and by the Straits of Georgia and Bellingham Bay on the west.

Natural Features: Starting at tide level on the west, the elevation of the county gradually heightens until the crest of the Cascade Mountains is reached on the eastern boundary. This mountainous area, which contains about 60 per cent of the county, is heavily timbered and is included in the Washington Forest Reserve. Just within this reserve is rugged Mount Baker, 10,827 feet high and the goal of many a band of tourist adventures. The southwestern portion of the county is rather rolling, while the northwestern part, composed of the valleys of the Nooksack and its tributaries, is practically level agricultural land stripped of its timber and contains the bulk of the population. A number of picturesque lakes are to be found dotting its surface, while several large islands add to its land area.

Population: The 1910 census gave a population of 49,511, about evenly divided between Bellingham, the county seat, and the remainder of the county west of the reserve. Nearly every nation seems to be represented, including a few Japanese and some Chinese who work in the canneries. Altogether 20.8 per cent were foreign born white. Of particular interest is a strong colony of Hollanders engaged in dairying near Lynden. In the timber industries, Scandinavians are conspicuous. The years succeeding the census have witnessed substantial growth.

Climate: The fact that the county is the most northern should not presuppose a rigorous climate. The reverse is the case. The record for 1912 shows a precipitation of 27.42 inches at Bellingham, only 2.8 inches of which was in the form of snow. The annual mean temperature was 61.2 degrees; the highest, 92 degrees on July 17, and the lowest 10 degrees on January 1. The first autumn frost was October 27 and the last spring frost March 30. The equability of climate is due to the warm moisture bearing winds from the Pacific and the protection afforded by the mountains on the east.

Land: The county's entire area is 1,332,480 acres, of which 815,080 acres are in the forest reserve, 5,160 acres are unappropriated public lands, 12,561 are in the Lummi Indian reservation, and 31,925 acres are State lands. In 1910 there were included in farms, 145,747 acres, of which 46,885 acres were improved. In addition to the unimproved land in farms, there are approximately 125,000 acres of logged-off area, making altogether in the county over 200,000 acres of logged-off land ready for settlers.

Soil: The agricultural area is rich in the soil elements. Much of the valley land is alder bottom, consisting of a sandy slightly calcareous loam, while the uplands are chiefly a clay loam. In the western part are found peat swamp, tidal swamp, and marsh lands.

Prices of Land: Values vary greatly. From $75.00 to $200.00 will best represent the prices for improved river valley areas; $50.00 to $100.00 for average improved timber lands, while $20.00 to $40.00 will buy the best of the wild or partially slashed stump lands. In the foot hills and in the

uneven sections there are still offerings at $8.00 to $15.00.

Natural Resources: In addition to the fertile farm lands there are practically inexhaustible forests containing billions of feet of timber, while water front industries utilize the products of forest, mine, soil, and sea. The soil and the sea contributed equally in 1912, the yield of each being about three and a half million dollars, while the manufactures of the county, including timber products, were about equal to the sum of these. There is room for unlimited future expansion in these industries and a field for small factories as side lines. Dairying, with allied pursuits, is fast becoming of prime importance.

Water: The Nooksack river and innumerable lakes are the main sources of water supply. Lake Whatcom, with 345 feet elevation, and Lake Padden, 425 feet elevation, both practically within the city of Bellingham, afford beautiful recreative features of hunting, fishing, and summer resorts. More than 10,000 horse power of energy is now generated, but there is capacity for hundreds of thousands more.

Transportation: The Great Northern and Northern Pacific railways traverse the county north and south. The Bellingham Northern—part of the Milwaukee system—runs from the harbor to the coal fields of Mount Baker. An interurban system radiates from Bellingham to the south and other lines are projected north and east. Steamers ply between the county ports and all points on the Sound, while California and Alaska freight and passenger boats make regular calls. The products of mill, forest, factory and farm are here loaded on steamers and sailing craft for all parts of the world. The county wagon roads are the pride of the state.

Wages: Common mill work $2 to to $2.50 for men and $1.25 to $1.75 for grown boys. Skilled labor in mills and boat building, $3 to $6; and in machine shops, $3 to $4. Farm hands get $30 to $40 and keep, except that at harvest time as high as $3 per day and board is offered. Hundreds of girls and women find work from June to September in the fish and fruit canneries and hundreds of men find employment as independent gill net fishers, during the salmon run. Fishing for herring, smelt, cod, shrimp and halibut, employ many others at wages varying from $50 to $100 a month and keep.

Social Conditions: Schools, churches and religious bodies of all denominations are to be found; fraternities are well represented; county fairs, old folks reunions and state and national conventions are frequently held. There are 28 post offices, 77 school districts and 26 high schools in the county. An unique divertisement is the annual Marathon race that is run in August from the city of Bellingham to the summit of Mount Baker, 42 miles distant. The course lies over country roads, forest trails, cragged mountain sides, crevasse bisected glaciers and deep snow fields, with changing temperatures and varying densities of air. The modes of conveyance are steam locomotives, racing cars, horses, skis, snow shoes, etc., all racing at dangerous speed. The large prizes offered and the novelty of the race attract the famous athletes of the world as well as an army of sight-seers.

CITIES AND TOWNS.

Bellingham: (County seat.) Altitude 110 feet. Population, 1910 census, 24,298. Local estimate 35,000. The metropolis of the county as well as of other neighboring territory. It is a jobbing center and nearest commercial port to Alaska, which affords a ready market for much of its manufactured, agricultural and dairy products. It is the fifth city of the state in population and fourth in bank clearings, exports, manufactures and postal returns. It is the principal location for the salmon canning industry and has several of the largest saw and shingle mills of the state. Other important industries include various wood working industries, fruit canneries, a cement plant, tile and brick works and boiler works. In 1911 the total value of its manufactures was over $7,000,000.00 The commercial importance of the city is increased by an ideal harbor and extensive wharfage, and by the 23 trains supplied by the Northern Pacific, Great Northern and Chicago, Milwaukee & St. Paul railways and by the Puget Sound Traction Company. Steamers leave for Sound points, coast cities and foreign ports. The city has 16½ miles of paved streets, 23 miles street railway, a gravity water system, electric lights, three paid fire departments and two parks. It supports two high schools, eleven grade buildings, a Catholic school, fifteen churches, two daily papers, four weeklies, and a public library containing 40,000 volumes.

Blaine: Altitude 42 feet. Population (1910 census) 2,289. Local estimate 3,500. A growing city situated on the boundary line of British Columbia and on Drayton Harbor. It is the most northwesterly municipality in continental United States. Transportation is supplied by the Great Northern Railway Company and daily steamers. Its geographical location, as a gateway to Canada, makes it a port of entry into the United States. It has electric lights, waterworks, telephone, and paved business streets; two newspapers, a forty acre public park, three grade and one high school and a volunteer fire department. Among its important industries are five salmon canneries, one crab cannery, one saw mill and box factory, a lacquer factory, numerous shingle mills, and two machine shops. A large area in the vicinity is in cultivated oysters, while good farm lands are available. Free sites are offered for worthy industries. The present payroll is about a half million per year.

Sumas: Altitude 40 feet. Population 1910 census, 902. Local estimate 2,000. An important railroad town on the border of British Columbia, the junction and custom port of the Northern Pacific Railway Company, the Canadian Pacific Railway Company and the Bellingham Northern. It is a supply point for a large area of rich farming and fruit land located within the county and just across the border. It has a high school, two grade schools, paved business streets, water works, electric lights, telephone exchange, a public library, and one newspaper. Three saw mills, four shingle mills, and a creamery are maintained. One of the largest pear and berry orchards in the west is being planted a mile from town.

Lynden: Altitude 95 feet. Population 1910, 1,148; estimate 1,500. Known as the "Gem" city of the interior county. Located in the center of a rich farming section. It has one high school, three grade schools, five churches, a public library, and a park. Several saw and shingle mills, and a sash and door factory employ many men. It is essentially a dairy town and sets the pace for that industry elsewhere. It has an extensive creamery and many large dairy farms. It has a municipal water works, a telephone exchange, public library and newspaper. The annual county fair is held here. Transportation is supplied by the Great Northern railroad and by auto stage.

Ferndale: Altitude 25 feet. Population 1910, 691. Local estimate 1,200. Located on the Nooksack river ten miles from the county seat. It has several saw and shingle mills, but its chief industries in the future will be farming, fruit culture and dairying. It is surrounded by good automobile roads and is served by Great Northern trains. Labor in mills and on farms is in considerable demand. A high school, a grade school, five churches, and a newspaper are supported.

Everson: Altitude 40 feet. Estimated population 350. An important dairying center on the Bellingham Northern railway. A large condensery canning about 50,000 pounds milk per day, and a fruit and vegetable cannery are located here. Town has Presbyterian church, ample school facilities and one newspaper.

Nooksack: Altitude 98 feet. Population (local estimate) 450. A dairying center three miles from Everson on the Northern Pacific railway. Each town shares the other's advantages. It has two creameries, two churches, a high school, weekly newspaper and electric lights. Berry growing and general farming are successful industries.

Kendall: Altitude 546 feet. Population (local estimate) 350. Town has a limestone quarry for cement manufacturing, one church and school. Lumbering and agriculture are carried on in the vicinity. Bellingham Northern railroad.

Marietta: A lumber town located on the shore line just northwest of Bellingham. Fishing, dairying, poultry raising and gardening are important.

Other centers are Clearbrook, Custer, Glacier, Park, Standard, Van Zant, Semiahmo, Clipper, Lawrence, Barron, Maple Falls, Deming, Acme, and Mountain View.

SKAGIT COUNTY.

The general topography of this county, the climatic conditions, its products and means of transportation, resemble those of Whatcom on the north and Snohomish on the south. Interested inquirers should read the descriptions of all three.

Natural Resources: The east half is very mountainous and heavily timbered, reaching as it does up into the

summits of the Cascades. Many mountain streams, however, cut through the barriers and soon unite with the Skagit river. This river, flowing a distance of 135 miles from its source in British Columbia, bisects the western half of the county and, after forming one of the richest bodies of agricultural land in the state, empties into the Sound, which bounds the county on the west. The western half of the county is in places very level and in others quite rolling, with a gradual slope towards the salt water, which forms a number of excellent harbors as well as considerable valuable tide land area. A number of islands are also included in the county's limits, chief of which are Guemes and Cypress.

Population: The census of 1910 gives the county 29,241, showing an increase since 1900 of 8,747 or 61 per cent. Of the foreign nationalities Scandinavians predominate although nearly all other countries are represented. About 21 per cent are foreign born white. This section is rapidly growing.

Lands: The total land area is 1,135,360 acres. 493,840 acres are included in the forest reserve, 7,000 in unreserved government lands, and 84,650 in the state's holdings, leaving over 500,000 in private ownership, about 300,000 acres of which are assessable timber lands and the remainder chiefly logged-off or totally cleared agricultural area. All of the logged-off lands are tillable but not over 75,000 acres are at present intensely, nor 50,000 more partially, farmed, making about 1,897 farm occupancies.

Soil and Crops: The bottom lands consist chiefly of alluvial loam. The tide and marsh lands are peat while the uplands and benches are principally a clay loam. All are very productive. In 1911, 20,000 acres produced 1,800,000 bushels of oats. Timothy hay yields 3 to 5 tons to the acre while clover and the vetches yield 4 to 6 tons an acre.

Climate: The climate of the valley is mild and equable, resembling North Carolina and Georgia but with less degrees of variation, the average daily range being not over 9 degrees. The winter months of December, January and February, average 38 above and the other nine months range from 45 to 85 above. The precipitation varies from 26 inches in the west to 42 inches in the east of the county.

Prices of Land: Logged-off land can be bought in large areas from original owners at from $15.00 to $25.00 and in small tracts at from $25.00 to $40.00 per acre. The cost of clearing varies considerably but averages about $100.00 per acre. Much of the oldest and best land is worth in earning values up to $400.00 per acre, but very little of this is on the market. Large areas of the wild land can be made equally productive by thorough clearing and careful preparation. There are a few opportunities to rent for about $18.00 per acre.

Natural Resources: For many years to come the greatest financial returns will probably be from the forests. Not counting the reserves, there are about twelve billion feet of assessable standing timber. Every little town has its saw mill and shingle mill, together with the allied industries. Eventually, however, dairying will be the main support. Even now, more are employed at this industry than at any other. Three large milk condenseries and a number of creameries are maintained. General farming with production of oats, hay, fruits and vegetables, are now important, while a few ranches are making a specialty of producing vegetable and grass seeds for market. There are unlimited limestone deposits for cement manufacturing. Two large plants are now in operation. Two coal mines are also running, while gold mines have been worked for years. The fishing industry supports extensive salmon canning plants, codfish curing and packing establishments, and fertilizer factories.

Water: Water is nowhere needed for irrigation. For domestic purposes, the supply is pure and unlimited and obtained in the river valleys from springs and creeks or shallow wells. Numerous beautiful lakes, well stocked with fish, are to be found in the valleys and on the mountain heights. Thousands of horsepower from mountain streams are, at present, going to waste, but several power plants are in process of construction on the Skagit and Baker rivers.

Transportation: The Great Northern railway bisects the county both east and west and north and south; the Northern Pacific railway traverses it north and south; while the trolly system of the Pacific Traction Company connects the principal towns with Bellingham and will eventually extend to Everett and Seattle. Steamships ply between Anacortes and other Sound ports. Foreign vessels also stop

here. The Skagit river is navigable for 30 miles. The county has 275 miles of good automobile roads and 375 miles of other roads that compare well with any in the state.

Markets: Markets for the huge oat crops, the cement, and fish products, are found in all parts of the world even as far as the Orient. British Columbia, Alaska and the Sound ports furnish buyers for all surplus fruit, vegetable and other farm products. Logs, piling, and shingles are carried by train and steamship to near-by and far-away markets.

Wages: Farm labor is paid about $45.00 per month and board. Common labor at mill, farm, or cannery is paid from $2.00 to $2.50, while skilled artisans receive from $3.00 to $7.00. Harvest hands get from $2.50 to $3.00. Women, girls, and boys in cannery work often earn from $2.00 to $4.00 per day during the fishing season. Berry and fruit packers are usually scarce and command good pay.

Social Conditions: The people are generally prosperous. Splendid grade and high schools are provided; public libraries and pretty churches are in nearly all the towns; good roads and public improvements are encouraged; and evidences of hospitable social life are everywhere apparent. Mail service is excellent and 35 postoffices are maintained. There are 81 school districts.

CITIES AND TOWNS.

Mount Vernon: County seat. Altitude 15 feet. Population 1910, 2,381. Local estimate 3,000. Prettily located on the navigable Skagit river and the Great Northern Railway about 8 miles from the Sound. It is the mercantile and social center of the county and is surrounded by valuable farm and dairying lands. Dykes protect it from the river. Its most important industries are two large condenseries of the Pacific Coast Milk Company, a large creamery, a machine shop and wood working plants. A high school, two grade schools, ten churches, and other public buildings are supported. It has two newspapers, municipal water works, electric lights, telephone system, and a volunteer fire department, and four miles paved streets. It is also a terminal of the interurban system which extends to Bellingham.

Anacortes: Altitude, sea level. Population 1910, 4,168. Local estimate 5,500. Located on Fidalgo island. It is the seaport of the county and is reached by the Great Northern Railway as well as by regular passenger and freight steamers. It has extensive wharfage and excellent facilities for deep water traffic. Terminal rates apply. Lumbering and fishing industries, together with agriculture, dominate. Its main industries are, nine shingle mills, three lumber mills, two cedar siding factories, two glue and fertilizer plants, two codfish plants, six salmon canneries, two shipyards, three machine shops, one box factory, one fruit and vegetable cannery, one creamery, and cold storage plant, one feed mill, one fresh fish packery, an ice plant, and a glass factory. Payroll amounts to at least $100,000.00 monthly. It has ten churches, one high school, four grade schools, a public library, and two newspapers; also two parks, a paid fire department, a gravity system water supply, and electric lights. Plenty of factory sites, with rail connections and deep water frontage, are available.

Sedro Woolley: Altitude 50 feet. Population 1910, 2,129; local estimate 3,000. A railroad center located in the rich valley of the Skagit river. It is served by the Great Northern, Northern Pacific and the Bellingham interurban. Tributary to it are rich level farming lands and timbered mountains. For industries, it has two machine shops, one foundry, five shingle mills, veneer mill, furniture factory, ice and cold storage plant, creamery, milk condenser, elevator and feed mill, vinegar factory, and a round house. The town has seven churches, one high school, two grade schools, public library, two newspapers, and the State's Northern Hospital for the Insane. It also has a volunteer fire department, gravity water system and electric lights. A county rose show is held here in June. Payroll is about $400,000.00 annually.

Burlington: Altitude 35 feet. Population 1910, 1,302. Local estimate 1,400. A railroad center served by the Great Northern Railway entering from four directions and by the main line of the Bellingham interurban. It is also the center of the automobile traffic of the county. Sustaining industries are shingle manufacturing, dairying, fruit and poultry raising. It has seven churches, a high school, one grade school, a weekly newspaper, electric lights, volunteer fire department, and city park. County fair is held here.

La Conner: Altitude, sea level.

Population 1910, 603. Local estimate 735. Located at the mouth of Skagit river and at the head of Snohomish slough, it becomes the export depot for the rich oat fields and seed farms of the famous La Conner flats. Transportation facilities are good. It is the oldest town in the county and richest in wealth per capita. It has a shingle mill and one saw mill with daily capacity of about 40,000 feet. About 150 men find employment in the fishing industry. Four churches, a high school, and weekly paper are supported. City has electric lights, gravity water system and a public park.

Concrete: Altitude 210 feet. 1910 population 945. Local estimate 1,250. Located at the junction of the Skagit and Baker rivers and surrounded by fertile valley and snow capped mountains. Main industries are the manufacture of cement, lumber and shingles. The Washington and Superior Portland Cement Companies are operated here with a daily output of about 5,000 barrels. City has two churches, good school facilities, two newspapers, and electric lights.

Hamilton: Altitude 96 feet. Population 1910, 405. An important lumber town on the north bank of the Skagit river. Iron ore is also shipped. Two churches and a high school are supported. Much logged-off area suitable for farming can be secured.

Lyman: Altitude 100 feet. Population 1910, 441. Local estimate 500. A lumber and shingle manufacturing town centrally located within a section suitable for dairying and stock raising. Splendid hunting and fishing grounds are handy. City has two churches, a high school, a weekly paper, and electric lights.

Alger: Population (local estimate) 400. A logging and dairy center located on the Pacific highway and a branch of Great Northern railway, about 13 miles south of Bellingham. It has one church, school facilities, and electric lights.

Big Lake: Altitude 95 feet. Estimated population 600. Located on the Northern Pacific Railway. Saw mills, shingle mills, planing mills, and brick and tile plants are the chief manufacturing concerns. Town has a union church, good school facilities, electric lights, and volunteer fire department.

Clearlake: A saw mill town, prettily located between two lakes on the Northern Pacific Railway. It has electric lights, two churches and school facilities.

Grasmere: Altitude 500 feet. A shingle mill town and agricultural center, located in Skagit Valley on the Great Northern railway. Plenty of good land is available. Concrete, with its cement plants, is a few miles away.

McMurray: A lumber and shingle town on the Northern Pacific railway. It has a church, a grade school, and electric lights.

Milltown: A lumbering, fishing, and farming center on the Northern Pacific railway and close to the Sound. Three boats stop there each week. It has two churches and a grade school.

Montborne: Altitude 150 feet. A saw mill town situated on Big Lake and the Northern Pacific railway, surrounded by forests and trout streams. It has electric lights and grade school.

Other centers are Bay View, Samish, Baker, Minkler, Prairie, Fir, Belleville, Bow, Rockport, Edison, Fidalgo, Avon and Marblemount.

SNOHOMISH COUNTY.

Topography: This county, lying between Skagit and King counties, slopes gradually toward Puget Sound, bounding it on the west, and rises to the heights of the Cascade mountains on the east. Its area is 2,064 square miles. The western portion comprises a great agricultural area very little higher than the Sound, while the eastern portions include the lower foothills of the mountains, as well as Glacier Peak, 10,436 feet high, and many other lesser heights. This portion is all thickly timbered and is in the Snoqualmie and Washington forest reserves. The county is drained by several important rivers, including the two forks of the Stillaguamish, the Snohomish, the Sauk, the Skykomish and the Sultan, each producing much level and highly productive delta land. Much of the county is logged off and eminently suited to dairying. The forty miles of waterfront is one continuous harbor.

Population: The 1910 census gives the county 59,209, ranking it, in this respect, fourth in the state. Nearly a half were in the city of Everett. The growth of the section was phenomenal during the ten years following the 1900 census, the increase for the county being 35,259, or 148 per cent, and for Everett, 16,976, or 216

per cent. The citizenship is mostly American, but Norwegian, Swedish, German and Canadian subjects are prominent.

Lands: Snohomish contains approximately 1,320,960 acres, of which 671,120 acres are in forest reserves already mentioned, and 30,616 are state lands. Practically all of the remainder, which was originally covered with forest growth, is now surveyed and occupied. About 300,000 acres are "logged off," of which the 1910 census shows that there were 118,328 acres in 1,680 improved farms having 34,126 acres improved, the whole having a value of $13,346,133.00. At least 200,000 acres of the unimproved stump land is of good soil and agricultural value, and most of it may be bought at reasonable prices. Much of the privately owned timber land also will eventually become good farming property, while many good pieces are probably locked up in the reserves. In this county, also, there is a large area of reclaimed tide flats which yields heavily.

Soils: There are many varieties of soil and all are intensely productive. The river bottom lands and the extensive deltas formed by former flooding are a rich brown or black sandy loam, the deposits of the decomposing porphyritic and calcareous glacial silt. Much of the uplands also are so formed and enriched by the detritus of its ancient vegetation. All are admirably adapted to the growth of cereals, vegetables and fruits. No irrigation is needed, the annual precipitation being from 36 inches on the coast to 42 inches on the uplands. The heaviest precipitation is from November to April, but from six to nine inches are distributed during the summer months.

Prices of Land: Unimproved land, including considerable "cut over" land and some partially slashed or cleared, is worth from $15.00 to $100.00 an acre. Some already thoroughly cleared and improved can be bought at from $100.00 to $300.00 an acre. Depending on its use, from five to twenty acres is sufficient for a medium-sized family. The cost of clearing described for other waterfront counties will apply to Snohomish. New land can be obtained on long-time payments, by lease, or a combination of both, while improved land can sometimes be rented on shares or for cash.

Water: Shallow wells, giving pure cold water, are obtainable on all agricultural lands and no better water is obtained than that bubbling from the springs and mountain streams. The Sultan river, the two forks of the Stillaguamish and the north and south forks of the Skykomish, together with several smaller streams, contain millions of horsepower as yet unharnessed. The Stillaguamish has about 220,000 and the Skykomish 240,000 possible horsepower. The Snohomish river is navigable 12 miles from Everett to Snohomish.

Natural Resources and Industries: For many years to come the dense forests of fir, cedar, spruce and hemlock will furnish the main industries, including logging, lumber and shingle manufacturing, and the re-manufactures from these. Nearly every town and village has one or more mills. Even the down cedar of the logged-off lands will yield sufficient to bear much of the cost of clearing. Within the Cascade mountains is an extensive mineral belt that will in time produce much revenue. Fishing for salmon, halibut, cod and mackerel is important and two state hatcheries are in this county. Diversified manufactures are very important. The opportunities for development are unlimited, with the vast water power already mentioned and the raw materials to be obtained. The gross value of all manufactures for 1912 exceeded $12,000,000.00. As the forest gives way the lands described above will yield more fully and maintain many more people than are now in this locality.

Transportation and Markets: The Great Northern, Northern Pacific and the Chicago, Milwaukee & St. Paul railways traverse the valleys and penetrate the mountains. Trolley cars run between Seattle and Everett, making connections for Lowell and Snohomish. Lines are expected to continue north through the county towns. There are altogether 397 miles of steam and 39 miles of electric railroad in the county. There are 40 miles of waterfront and 12 miles of navigable river. Daily steamers ply between all Sound ports and many clear for foreign countries. The county roads are equal to the best in the state. The large cities, containing half the population, offer markets for farm products, while the excess manufactures are disposed of to eastern or over-sea trade.

Wages: There is usually a demand for both skilled and unskilled workers. Farm hands get from $2.00 to $3.00 per day when working by the

day without board; $35.00 to $45.00 per month are the ruling prices when board is included. Other wages are similar to other parts of the Puget Sound country.

Social Conditions: Since all modern facilities for home comfort, travel, recreation and education are plentifully provided, social conditions are highly developed. Music, art and architecture are greatly encouraged. Fraternal and benevolent societies are many, and every opportunity for religious culture is provided. The schools are attractive, commodious and thoroughly equipped. There are 43 postoffices, 18 rural routes, 83 school districts and 18 high schools.

CITIES AND TOWNS.

Everett: County seat. Population, 1910 census, 24,814, an increase of 216 per cent during the decade; local estimate, 27,500. Strategically located on a peninsula created by the waters of Puget Sound and the navigable Snohomish river winding around its northern and eastern borders. It has 22 miles of deep water frontage suitable for manufacturing purposes and three-fourths of a mile of dockage. The 90-odd manufacturing plants, together with the Great Northern shops and public service corporations, have given her the name "City of Smokestacks." Between four and five thousand men are employed, with wages of over $4,000,000. Chief of these are the lumber and shingle manufacturing mills, machine manufacturing plants and paper mill. The products reach an annual value of many millions and are marketed throughout the world. It has the only arsenic plant in the United States, two flour mills, a powder factory, a tannery, a brick yard, and a smelter. Raw material is plentiful and special encouragement is given to desirable concerns. There are five banks with combined deposits of about $5,000,000. The city is served by the Great Northern, Northern Pacific, Chicago, Milwaukee & St. Paul and Canadian Pacific railways, besides two electric systems connecting with Snohomish and Seattle. Five steamers run daily to Seattle and one to Bellingham. Other vessels from all parts of the world visit here. It has 14 miles of electric railway, 19 miles of paved streets, and over 80 miles of cement walks. A $165,000.00 high school, eight grade schools, besides a separate vocational school and a number of private colleges are supported. It is lighted by electricity and gas. City has a public library of over 10,000 volumes, two telephone systems, two daily and four weekly newspapers, over 40 churches, a Y. M. C. A., four city parks and a number of large playgrounds. An industrial exhibition and a great festival called "Kla how Yah" are held each year.

Snohomish: Population 1910, 3,244; local estimate, 5,000. The oldest and second city of importance in county. Its slogan is "Garden City." Located in the center of a rich agricultural area at the head of navigation on the Snohomish river and on the lines of the Great Northern and Northern Pacific railways with trolley car service and river boats to Everett. Business streets are paved. It is provided with municipal water system, electric lights and gas, sanitary sewer, telephone, telegraph and free mail delivery. City has nine churches, a four-year high school, one German Lutheran school, a public library of 2,500 volumes, two weekly papers and a city park. It has two lumber mills, six shingle mills, a condensery, creamery, cannery, iron works, brick yard, cement and concrete plant and many other industries. The yearly payroll is over a half million. County fair is held here in September.

Monroe: Altitude 50 feet. Population, 1910 census, 1,552. A pretty dairy and agricultural city in the Skykomish river valley near its juncture with the Snohomish and Snoqualmie. It is served by the Great Northern main line, the Tolt branch and the Chicago, Milwaukee & St. Paul railways. City has a large milk condensing plant, two shingle mills and a creamery. Six churches, a high school, three grade schools, a public library, a public park and two newspapers are supported. It also has electric lights, paved streets and fire department. The State Reformatory is located here.

Marysville: Altitude 20 feet. Population, 1910, 1,239; local estimate, 1,500. An agricultural town on the rich delta land at the mouth of the Snohomish river. Ideal opportunities for dairying and farming industries and manufacturing of forest products are presented. It has three lumber and shingle mills and two straight shingle mills. There are five churches, a four-year high school, a library, one paper, electric lights and gravity water system. Payroll is nearly a quarter of a million annually.

Arlington: Altitude 107 feet. Population, 1910 census, 1,476; local estimate 2,200. At the confluence of the north and south forks of the Stillaguamish and on the line of the Northern Pacific railroad. Several logging camps, saw and shingle mills are in the vicinity. It has two creameries, a cheese factory and two machine shops. Payroll is about $180,000.00 annually. It has two newspapers, modern high school, five grade schools, ten churches, electric lights, water system, and paved business streets.

Lowell: Population, 1910 census, 1,007; local estimate, 1,500. Adjacent to Everett and one of the oldest settlements on the Snohomish river. Noted for its paper and pulp mills, which never close except at Christmas and 4th of July. It also has a tannery, sawmill, shingle mill, a large box factory and creosote plant. Other than being a separate corporation, this city is practically a part of Everett, description of which should be read in this connection.

Edmonds: Altitude, tide level to 300 feet. Population 1910, 1,114; 1900, 474; increase, 138 per cent. A waterfront city midway between Seattle and Everett, on the main line of the Great Northern railway. Passenger steamboats and a trolley system not far away keep it in hourly connection with Seattle and Everett. It has eight shingle mills, one steel and bolt factory, one box factory, and an excelsior plant with a payroll of nearly a quarter million annually. City enjoys a water system, electric lights, two weekly papers, four churches, a new modern high school building, public library, and telephone service. Choice tillable land suitable for fruit, berries, truck and dairying is purchasable.

Stanwood: Altitude, sea level. Population, United States census, 554; local estimate, 1,000. On the Great Northern coast line, with steamer service to Seattle three times weekly. Surrounded by the rich dyked farm lands noted for wonderful oat production. Land is also adaptable to dairying and diversified farming. City has a sawmill, three shingle mills, a gravity water system, electric lights, two and one-half miles of paved streets, four churches, a high and grade school, a Norwegian Lutheran school, two telephone lines and a weekly newspaper. Sites are free for manufacturing enterprises of merit.

Startup: Altitude 34 feet. Population (local estimate) 500. A lumbering and mining center in the valley of the Skykomish river on the main line of the Great Northern railway and on the route of the scenic highway soon to be built by the state. Town has two churches and a grade school.

Three Lakes: Altitude 600 feet. Population (local estimate) 550. A lumber and shingle manufacturing town located on a logging railroad having connection with the Great Northern, Northern Pacific and Chicago, Milwaukee & St. Paul railways. It has church and school facilities and electric lights.

Florence: Population (local estimate) 400. Situated on the Stillaguamish river a short distance from its mouth. Reached by steamer service from Port Susan harbor. Surrounded by good dairy land. Contiguous to creameries and condensers. Has two churches and school work through the 11th grade.

Gold Bar: Altitude 189 feet. Population (local estimate) 750. In a valley near the confluence of the Skykomish and Wallace rivers, and on the Great Northern railroad, which maintains yards and shops here. A heavily timbered district surrounds it. Land is adapted for dairying, general farming, bush fruits and pears. Good land close in can be bought for from $20.00 to $60.00 an acre. Town has gravity water system, electric lights, a church, one school, a newspaper, and telephone and telegraph facilities.

Granite Falls: Altitude 396 feet. Population 1910 census, 714; local estimate, 1,000. Located on the Northern Pacific railway and surrounded by land well suited to dairying and vegetable growth. Granite rock, coal deposits and water power are in vicinity. Shingle and lumber manufacturing are the main industries. City has gravity water system, electric lights, four churches, high and grade schools, two parks, telephone service and a weekly newspaper. An annual Ranchers' or Grange Fair is held in August.

Index: Altitude 531 feet. Population (United States census) 417; local estimate 500. On the main line of the Great Northern railway in a mountainous and thickly timbered section. In close proximity are important granite ledges. One granite quarry is in operation. Saw and shingle mills and logging camps are in vicinity. City has gravity water system, electric lights, one church, high and grade school, public library and a weekly newspaper.

Mukilteo: Altitude, sea level. Population (local estimate) 700. Reached by Puget Sound steamers and trains. Here Governor Stevens, first executive of the territory, signed memorable treaty with Indians. Chief industries are lumber and shingle manufacturing. A powder mill is two miles away. Land in vicinity is suitable for fruits, cattle raising and dairying. It has four churches and good school facilities.

Sultan: Altitude 102 feet. Population (United States census) 576; local estimate 1,000. A lumbering, dairying and mining center located on the main line of the Great Northern railway at the confluence of the Skykomish and Sultan rivers. About 400 men are employed in the town and near by. Some placer mining on Sultan river and some quartz prospects. City has three churches, a four-year high school, two grade buildings, municipal water system, electric lights, cement walks and a newspaper.

Other centers are Pilchuck, Birmingham, Darrington, Edgecomb, Getchell, Hazel, Lochsloy, Maltby, Oso, Silvana, Sisco, Seattle Heights, Tulalip, Bryant, Norman, Monte Cristo and Silverton.

KING COUNTY.

This is the leading county of the state in point of population, commerce and finance. It has a strategic advantage of location, being central in Western Washington, with over a forty-mile mainland frontage on Puget Sound. Its total area is 2,111 square miles with a widely varied contour.

Topography: Beginning at sea level on the west, many fertile valleys, the largest of which trend north and south, alternate with wide plateaus of varying altitude until they are finally enveloped in the foothills of the Cascade mountains, whose tree-clad ridges, with a maximum elevation of 7,000 feet, form a zig-zag terminal line at the eastern boundary of the county and separate it from Kittitas and Chelan counties. The most important valley is the continuous one formed by the White and Duwamish rivers and used as the main portion of the thoroughfare between Seattle and Tacoma. Tributary to this, but trending generally east and west, are the valleys of the Black, Cedar and G een rivers. Another considerable area is formed by the Snoqualmie and its tributaries behind the second chain of hills trending toward the north. There are also a number of lakes with wide areas of tributary agricultural land. The most important is Lake Washington, from one to three miles wide and nineteen miles long, parallel to and a few miles back from the Sound, the country to the west forming the site of the city of Seattle. This lake is now being connected with the Sound by a government canal which utilizes Lake Union, in the heart of the city, as a part of its course. Lying behind it is Lake Sammamish, about eight miles long, and connected with the lower lake by a series of sluggish sloughs.

Population: The census of 1910 gives the county 284,638; that of 1900, 110,053; showing an increase for the decade of 158.6 per cent. Local conservative estimators now claim about 350,000; 26.3 per cent were foreign-born white and 4 per cent native or foreign other than white. Foreign-born in numerical ratio are: Canadians, Swedes, Norwegians, Germans, English and Italians, with all other nationalities represented. Of negroes there were 2,487 and of Orientals 8,884. Outfitting for Alaska, wintering here of large fishing and mining concerns of the North, together with much tourist travel, have contributed also to a large floating population.

Land: The whole region was once dense forest and much of it is still covered with valuable timber, while another large portion is in the logged-off land state. The most important timbered portion is the mountain region in the eastern part included in the Rainier and Snoqualmie forest reserves. There is no so-called prairie land in the county, but thousands of acres lie as level as could be desired, especially in the valleys already noted, and on a few elevated mountain plateaus. Besides the valleys and plateaus there are many fertile slopes suitable for fruit, pasture and stock raising. Fifty per cent of the county would be suitable for agriculture and much of the remainder splendid for grazing. The approximate land area of the county is 1,351,040 acres. Forest reserves take 463,120 acres, state lands include 60,621 acres, while only 4,480 are unappropriated and unreserved federal lands. The last census

shows 3,287 farms, containing 148,417 acres, or 11 per cent of the county. Only 54,923 acres, or 37 per cent, of this were improved.

Soil: In the White and Duwamish river valleys and their tributaries are usually found alluvial soils, such as silty loam, sandy loam and gravelly sandy loam, varying from a foot to twenty feet in depth. The sloping ascents from these valleys consist of sedimentary gravelly sandy loam, partly derived from glacial deposits enriched by later decaying vegetation. Where depressions left by former lakes occur, this is packed with silty clay or sandy clay with a thin muck surface and a subsoil of heavy clay. Higher up on the plateaus the surface soil consists of sandy and gravelly loam. At the mouth of the Duwamish is a small area that might be called tidal marsh. On the western slope of Vashon island is rich loamy sand and on its east side a gravelly sandy loam.

Climate: In the western half of the county, where the agricultural area and the bulk of the population are found, the rainfall is from 25 to 40 inches yearly. The temperature never reaches zero and only occasionally the freezing point. The summers are comfortable day and night, excessive heat being unknown. In 1912 the highest temperature at Seattle was 90 degrees, May 14, and the lowest 24 degrees, January 8. The precipitation for 1911 was 21.69 inches; for 1912 it was 35.14 inches; for 1913, less than 24 inches. Snowfall for 1911 was 4.1 inches; for 1912, 3.75 inches. The normal temperature by months for a 33-year period is as follows:

January	39	July	64
February	40	August	63
March	44	September	58
April	49	October	51
May	55	November	44
June	60	December	41

Prices of Land: The rich delta land of the rivers, traversed as it is by numerous railways, trolley lines and superb auto roads, and limited as it is in quantity, naturally brings the highest prices. Close to the small cities, where are situated the milk condenseries, creameries and fruit canneries, good land, when improved, commands from $200.00 to $500.00 per acre. For best lands close to Seattle prices will run higher, often higher than $1,000.00 an acre; valley slopes not so much improved, $100.00 to $200.00; wild land with stumps and brush remaining, of good soil and accessibility, from $50.00 to $125.00. Further remote choice land can be had at from $20.00 to $50.00, while hilly regions most suitable for dairying and stock raising can still be obtained at from $10.00 to $25.00. The average cost of clearing ready for the plow is generally stated at about $75.00 to $150.00 per acre.

Resources and Industries: Chief among the defined and developed resources of the county is the yet standing timber, the value of which is variously estimated. The conservative figures obtainable for 1910, the last year for a combined national and local estimation, give 8,356,640,000 board feet on privately owned land and 13,893,600,000 on reserved lands, or a total of 22,250,024,000 board feet. Although some diminution of the timber area takes place annually, the loss is compensated by the opening up of a corresponding quantity of logged-off land. The returns from acreage already under cultivation run into the millions annually. The most important crops include hay and forage, vegetables, fruits, nuts, livestock, dairy and poultry products.

Manufacturing has reached enormous proportions. Practically every class of enterprise is represented. The different plants are mentioned in connection with the various cities and towns. Among the most prominent are lumber and shingle mills, various wood product concerns, flour mills and grist mills, meat packing plants, machine shops, clay product plants, milk condenseries, canneries, etc. The fishing industry also is important. Vast quantities of fisheries products are handled every year through the port of Seattle.

Of great importance, too, is its commanding geographical position and the resulting transportation facilities. This factor and the enterprise of its citizens have been important in gaining for it its prestige as a commercial, manufacturing and financial section. It has large influence in the traffic with Japan, China, the Philippines, Australia and South America. The value of imports through the port of Seattle for the calendar year ending December 31, 1912, was $25,665,947.00; exports, $21,204,568.00. Total imports and exports were $43,829,417.00, with customs receipts of $1,509,168.00. The total appraised value of all property in the county is $559,623,881.00.

Water: The most important lakes

and rivers are mentioned elsewhere. For domestic uses nearly every town has water under pressure brought from some stream or lake, or pumped from deep wells. Scarcely any locality but what contains pure water not far beneath the surface. Water power has been comparatively little developed. Among the most important falls harnessed for use are Snoqualmie falls, having a sheer drop of 270 feet, and Cedar falls. It is estimated that the White river and its tributaries can produce a maximum of 285,000 horsepower, the Cedar river 200,000 horsepower and the Snoqualmie 400,000 horsepower. Only a fractional part has so far been energized.

Transportation: The Cascade range is pierced at three nearly equidistant points to admit the three great transcontinental railroads, the Great Northern, the Chicago, Milwaukee & St. Paul and the Northern Pacific. The Oregon-Washington Railroad & Navigation Company, which includes the Union Pacific, comes in from the south. The Canadian Pacific and the Chicago, Burlington & Quincy operate over the tracks of the Northern Pacific, while the Chicago & Northwestern and Southern Pacific have passenger service over the Northern Pacific and Oregon-Washington Railroad & Navigation rails, respectively. The Columbia & Puget Sound extends to the operating coal mining districts. The total mileage for steam railroads, including a number of logging roads, is over 778 miles. In addition, there are 281 miles of electric lines. The Puget Sound Electric traverses the county north to Everett with hourly service, and south to Tacoma with half-hour service. The Seattle & Renton Electric extends along the shores of Lake Washington. There is daily or more frequent freight and passenger service by water to other cities and landings on Puget Sound. A number of steamship companies operate regularly out of Seattle to Coast cities, Mexico, South America, Hawaii, and to Oriental, Australian and European ports.

Wages: Common labor outdoors commands $2.00 to $3.00, skilled from $3.50 to $6.00. Factory common labor wages are from $1.00 to $1.50 for boys and girls, $1.50 to $2.00 for men. Mechanical work in factories pays from $2.50 to $3.00. Men's clerical work returns from $60.00 to $100.00 per month. Women's work, including stenography, bookkeeping, etc., from $40.00 to $80.00 per month. Salesladies receive from $7.00 to $15.00 per week. An eight-hour day generally prevails.

Markets: The abundant methods of transportation greatly enlarges the markets for the county's products. Several localities now have canneries to preserve an overplus of fruits, vegetables, etc. Both the ripe and the preserved products are readily disposed of. There is never sufficient forage, seed, dried fruits, dairy stuff, poultry and animal products to supply even the local demands. The quadrupling of manufacturing plants and the additions of other new enterprises during the decade indicate a strong demand for all that can be produced. The manufactured articles from forest materials seldom accumulate, unless by reason of seasonal car shortage; the whole world is the market for these, while the Alaskan trade bids fair to take available eatables. All fisheries products are awaited and disposed of without delay. Salmon, halibut, cod, crabs, oysters and clams are expeditiously handled and return a large revenue annually.

Social Conditions: Metropolitan advantages are offered for social leadership. Architectural skill, musical and literary talent of high degree are to be found. Advantageously placed are adequate parks, playgrounds, libraries, art galleries, picnic grounds, boulevards, etc. These agencies, aided by ample means for rapid and safe transit, by land and water, in spite of the newness of the country and the eagerness of the people in amassing vast fortunes, have developed strong bonds of friendship among the surrounding localities and given ample opportunity for the development of the highest social tastes. The King County Fair is held at the Meadows in September. There are 133 school districts, 46 high schools, 82 main postoffices and 24 rural routes.

Vashon and Maury Islands: These two islands, practically one, connected at Portage by a narrow neck of ground, form an important part of the county. Their total area is nearly 23,000 acres, much of which is at present covered with timber, or is in the logged-off condition. Nearly all, however, is excellent agricultural land. Berries and fruits do especially well. Several greenhouses are here, one of them near Vashon being the largest in the West. The combined population is over 3,500 people. Most im-

portant settlements are Vashon, Burton, Chautauqua, Lisabeula, Cove and Colvos. A new modern high school costing $15,000.00 has just been completed at Vashon. Daily boats connect all points with Seattle and Tacoma, also with each other. A boulevard will in time extend all around. A public ferry has just been authorized to connect the island with the mainland, thus bringing the Seattle and Tacoma markets in close proximity. About $3,500.00 worth of eggs are shipped each month during the laying season. About $30,000.00 worth of strawberries were shipped last season. A special Vashon Island Fair is held each year at Vashon.

CITIES, TOWNS AND VILLAGES.

Seattle: County seat. Altitude, sea level to 500 feet. Area, 94.47 square miles, including water. Population, 1910, 237,194. Postal count, August 1st, 1913, 301,670. Foreign-born white element represents about 26 per cent of the whole. Of these, Canadians, Germans, Scandinavians, English, Irish, Italians, Russians and Scotch rank numerically in the order named. Interesting is the story of the city's founding in 1852, its struggle for existence, the destructive fire of 1889, and the rapid growth since, until it has become the second city in importance west of the Rockies, the twenty-first in the United States, and the first in the state. Its attractive and strategic location on a magnificent harbor (Elliot Bay) and in the midst of great resources, aided by the rapid growth of Alaska, has been largely responsible for this unusual development.

The city occupies the eminence of rolling hills, plateaus and valleys lying between Lake Washington, on the east and Puget Sound on the west, overlooking both these waters and extending by gentle slopes to the water's edge in either direction. It is a city of hills. One can go in a straight line ten miles north and south and not get out of the city limits, most of which is well settled. From nearly all parts there is visible either the Sound with the snow-capped Olympics beyond, or Lake Washington, seemingly fringed around with the Cascade mountains, while Mt. Rainier towers to the sky at its southern end. Within the city limits and surrounded by homes and business enterprises are two large fresh water lakes, viz., Lake Union near its geographical center and Green Lake just south of its northern boundary. From some favored sites all these beautiful waters may be seen at once, together with the government canal connecting Lake Washington with the Sound and costing $3,625,000.00. The larger lock for this canal will cost $2,300,000.00. To supplement this natural beauty, grand boulevards have been built and parks beautified. Many acres of tide flats have been filled in, creating the most valuable manufacturing sites in the city.

Foreign and domestic commerce, manufacturing, mining, fishing, shipbuilding and agriculture in all its branches contribute to its growth. No reliable figures are available showing the present value of manufacturing, which four years ago amounted to over $50,000,000.00, representing a capital of nearly the same amount. The total actual valuation of all property in 1912 was $473,175,660.00. Its assay office has received in gold since 1898, $210,407,068.00. In 1912 building permits were valued at $8,415,325.00. Clearings for its 27 banks were $602,430,661.00. Domestic and foreign commerce amounted to $121,425,175.00, representing 7,100,650 tons of cargo. There were carried in and out a total of 3,489,291 passengers.

Postoffice receipts in 1912 were $1,049,504.00. Real estate transfers amounted to $25,660,480.00. There are 237 miles of electric railway, 949 miles of cement walks, 178 miles paved streets, 617 miles graded streets, 31 miles of boulevard and 150 miles waterfront, including salt and fresh water. There are 58 steamship lines, which include some of the largest freight carriers in the world, seven transcontinental railways and three interurban electric lines.

Area of city parks is 1,428 acres, not including playgrounds, boulevards and triangles. There is invested in street improvements $39,745,163.00. The city library, with its seven branches, contains 175,000 volumes. City owns its lighting plant, which cost $3,636,187.00, serves 25,000 customers and lights 699 miles of street with 6,061 street lamps. Its water plant, also municipally owned, serves every one of its citizens with the famous Cedar river water. This plant represents an outlay of $12,682,046.00. Its reserve capacity is 270,102,000 gallons.

There are about 300 churches, representing every known denomination of Christian religion, 6 high schools,

64 grade schools and 26 private schools. Here also is located the University of Washington, a free state institution on a campus of 355 acres and with more than 3,000 students annually enrolled.

There are four large daily papers, four smaller dailies, 26 weeklies, 23 monthlies, 2 semi-monthlies and 1 quarterly. There are two depots not excelled by any in the West.

An annual festival called the Golden Potlatch and lasting for a week in July is held each year in commemoration of the arrival of the S. S. Portland with the first big Klondike gold shipment given to the world through Seattle. The King County Fair is held at the Meadows each September.

Renton: Altitude 50 feet. Population, 1910, 2,740; local estimate, 5,000. A pretty suburban town and coal mining center lying at the southern end of Lake Washington, about 10 miles from Seattle, and on the line of several trunk railways and two electric interurbans. Originally founded as a coal mining town, it is now prominent as a manufacturing city. Here are located one of the largest units of the Denny Renton Clay and Coal Company employing 400 men, the Seattle Car and Foundry Company with 300 men, and the mines of the Puget Sound Electric railway with 400 men, besides numerous other industries affording a payroll of $600,000.00 annually. It has five miles of paved streets, municipal water system, electric lights, volunteer fire department, a four-year high school, three grade schools, five churches and two newspapers. The lowering of Lake Washington by opening the canal will increase the area for manufacturing sites.

Kent: Altitude 56 feet. Population, 1910, 1,908; local estimate, 2,400. A thriving farming and dairying city in the heart of the fertile White river valley, midway between Seattle and Tacoma on the line of all the trunk railways as well as the Seattle-Tacoma interurban. Among its many industries are a large milk condensery, a wire manufacturing plant, Simplex bed factory, three saw mills, one shingle mill, incubator factory and a beehive factory. Town has municipal water system, electric lights, seven churches, a high school, two grade schools, city park and three newspapers. A flower show is held in August.

Auburn: Altitude 100 feet. Population, 1910, 957; local estimate, 2,500. A rapidly growing farming and dairying center located in the White river valley, 22 miles from Seattle. It is the junction point for the Northern Pacific railroad, which maintains its yards here with a large monthly payroll. It has a large condensery, tile manufacturing concern, saw mill, shingle mill, ice plant, seven churches, high school, public library, gravity water system, electric lights, volunteer fire department, two miles paved streets and two newspapers. It is served by all the trunk railroads, also by the Seattle-Tacoma interurban with two trains hourly.

Enumclaw: Altitude 752 feet. Population, 1910, 1,129; local estimate, 1,200. On a fertile plateau of the famous White river valley, 34 miles east of Tacoma, on the line of the Northern Pacific and at the end of a spur of the Chicago, Milwaukee & St. Paul railway. It has two saw mills, four shingle mills and a creamery. Dairying and general farming are important. Soil is known as the Buckley loam. It has city-owned water, electric lights, a high school, grade school, two weekly newspapers and a volunteer fire department. An annual Dairy Carnival is held in August.

Bothell: Altitude 36 feet. Population, 1910, 599; local estimate, 1,000. Located on the Northern Pacific railroad and the Sammamish river, connecting the lake of that name with Lake Washington. The soil of the valley consists of a fine sandy loam that yields in a remarkable manner. It has boat service to Seattle and other lake points. An automobile road to Seattle has just been completed. It has electric lights, good water, four churches, a high school, public library and one newspaper. It serves as a metropolis to the many little villages in the locality. There are good opportunities for factories.

Kirkland: Altitude 20 feet. Population, 1910, 532; local estimate, 800. A pretty suburban town on Lake Washington, just opposite Seattle. Gardening and dairying are important. It is served by the Northern Pacific railroad, also by regular ferry boats to Seattle. Transportation is such that people live here and work in Seattle. It has a woollen mill, electric lights, city-owned water, volunteer fire department and one newspaper. An agricultural exhibit is held yearly in October.

Kennydale: Population, 1910, 525; local estimate, 600. A lakeside suburban town across from Seattle where many of its citizens work. It is served by the Northern Pacific and Chicago, Milwaukee & St. Paul railways, besides three rival lines of lake transportation. Land is suitable for market gardening and floriculture. Near by are productive coal fields extensively operated. It has one shingle mill, one church and a high school.

Issaquah: Altitude 96 feet. Population, 1910, 628; local estimate, 2,000. Located on the Northern Pacific railroad at the south end of Sammamish lake, in a fertile valley suitable for dairying and truck farming. In a direct line it is only 13 miles from Seattle, by rail 42 miles and by auto stage 26 miles. Two active coal mines employing 600 men are nearby. It has a condensery, electric light service, waterworks, fire department, three churches, a high school and a newspaper.

Newcastle: Population (local estimate) 700. A coal mining town on the Columbia & Puget Sound railway. The Coal Creek mine produces over 200,000 tons annually. Electric lights, two churches and good schools.

Richmond Beach: Altitude 20 feet. Population (local estimate) 600. Fifteen miles north of Seattle on the Great Northern railway and facing the Sound. Everett interurban is 1½ miles east. Auto trucks make daily trips to Seattle. The Standard Oil Company and the American Gas Company have tanks here. Town has a shingle mill, an enamel brick plant, two churches and a high school. Good bathing beaches are near by. Richmond Beach strawberries are famous.

Algona: Altitude 112 feet. Population (local estimate) 800. A dairying and farming center on the Chicago, Milwaukee & St. Paul and Puget Sound Electric railroads. Berries, fruits and vegetables do well. Two churches and a grade school. High school pupils attend at Auburn.

Pacific: Population (local estimate) 700. A growing farming town in the rich White river valley, 3 miles from Auburn, on the Puget Sound Electric railway. Two churches and a high school.

Duvall: A town of about 50 people, attractively located in the Snoqualmie river valley and on the Chicago, Milwaukee & St. Paul and Great Northern railroads. Town is only three years old; has two shingle mills, saw mill, church, high school, good water and electric lights.

Tukwila: Population, 1910, 361; local estimate, 500. On the Puget Sound Electric railway, overlooking the Sammamish valley, near Seattle market. It has three nurseries, three shingle mills, electric lights and grade school. Floriculture is practiced. Berries and small fruits do well.

Tolt: Altitude 90 feet. A town of nearly 500 people, in the Snoqualmie river valley, on the Great Northern and Chicago, Milwaukee & St. Paul railroads. A vast body of timber is tributary; land is excellent for dairying and general farming. It has a saw mill, a shingle mill, two churches and a high school. Streets are paved; electric lights are being installed.

Preston: Altitude 500 feet. A lumber and shingle mill town of several hundred people, on the North Bend branch of the Northern Pacific railway. It has one church and two grade schools.

Redmond: Altitude 30 feet. Population (local estimate) 350. A farming center one mile from Lake Sammamish, on the Northern Pacific railroad. Stage connects with Kirkland; auto trucks make daily round trips to Seattle. Dairying and poultry raising are important. It has two churches, a high school and newspaper. Electric lights are being installed.

Skykomish: Altitude 960 feet. Population, United States census, 238; local estimate, 400. A sawmill town on the Great Northern railway in the upper part of the valley of same name. It has a high school and municipal water and lighting systems.

Taylor: Altitude 1,174 feet. Located on the Columbia and Puget Sound railway. Townsite owned by Denny-Renton Clay & Coal Company, who manufacture various clay products. Coal mining is carried on. Electric lights and water system.

Kerriston: Altitude 1,214 feet. Population (local estimate) 450. A saw mill with 150,000 daily capacity is the chief industry. On the Northern Pacific railroad and near headwaters of Raging river.

Selleck: Altitude 1,100 feet. A lumber, logging and shingle town, on the Northern Pacific and the Chicago, Milwaukee & St. Paul railways. Timber supply unlimited. Electric lights and gravity water system.

Maple Valley: A farming center of about 350 people, 23 miles from Seattle, on the Columbia & Puget Sound and Chicago, Milwaukee & St. Paul railways, between north and south forks of Snoqualmie river. It has a lumber mill, shingle mill, the King county stone quarry, one church, a high school, city water system and electric lights.

Black Diamond: One of the most important coal mining towns in the state and located on the Columbia & Puget Sound railroad. Yearly coal production is about 400,000 tons.

Population is about 2,000. Chiefly Welsh, Italians, and Austrians. Auto stages run to Kent and Auburn. Dairying has possibilities. There are three churches, a four-year high school, and electric lights.

Vashon: A farming town of about 400, located on island of same name. A new high school is being built. Fruit growing, berries, floriculture and poultry raising are important industries.

O'Brien: Population (local estimate) 300. A farming center located on the Northern Pacific, Chicago, Milwaukee & St. Paul and Puget Sound Electric railroads. It has a cheese factory, pickle factory and good school facilities. Dairying is successful.

Ravensdale: An important coal mining town on the line of the Northern Pacific. A heavy timber belt is tributary.

Thomas: Population (local estimate) 250. Located in the center of the rich White river valley not far from Kent, on the Great Northern, Northern Pacific, Chicago, Milwaukee & St. Paul and Puget Sound Electric railways. Dairying, berry growing, poultry farming and gardening are important. Children attend Kent high school. It has a Methodist church.

Other centers are Factoria, Nagrom, Rockdale, Cumberland, Grotto, Hobart, Hollywood, Inglewood, Orillia, Hazlewood, Kenmore, Fall City, Monohon, Pontiac, Black River, Elliot, Barneston, Eagle Gorge, Baring, Chautauqua, Bryn Mawr, Christopher and Kangley.

PIERCE COUNTY.

This county ranks third in the state in population, wealth and business importance. It marks the upper end of Puget Sound and is central to Western Washington.

Natural Features: Its area of 1,701 square miles contains the greatest variation in elevation to be found in any single county of the United States, ranging as it does from tide level on the west to 14,408 feet on the snow-capped heights of Mt. Rainier (or Mt. Tacoma) in the southeastern corner. There is one river of importance, the Puyallup, which, with its tributaries, forms the valleys containing the best agricultural land. The Nisqually, forming the boundary line between Thurston and Pierce, divides its fertile area between the two counties but has tributaries which are totally in Pierce county. Above the valleys are the plateau's—forest covered steps to the scenic peak—that rise tier above tier to the limit line of vegetation. Snugly ensconced upon these are innumerable lakes, natural reservoirs of the life and power of the hills. Nearer the Sound and gently rising from the shores between the river valley depressions, are rolling prairies, well drained and carpeted in spring with a great variety of wild flowers and wooded in spots with moor oak, likening the vicinity both as to appearance and feeling with the moors of southern England or the plains of Normandy. Several important islands in the Sound also belong to this county, offering peaceful and picturesque homes to those desiring closer intimacy with the water. Thus we find a combination of the physical divisions of mountain, plain, valley, river, bay and island in one small compass.

Population: The census of 1910 gives the county 120,812; that of 1900, 55,515, showing an increase of 117.6 per cent for the decade; 83,743 were in the city of Tacoma alone; 71.3 per cent were native-born white; 25.9 per cent foreign-born white, and 2.8 per cent negroes and Orientals. The foreign-born in greatest numbers were Scandinavians, Germans, Austrians, English and Canadians. A steady growth has taken place during the past three years.

Lands: The total land area is 1,088,640 acres, from which 323,220 acres have been taken for the Rainier National Park and Rainier Forest Reserve, and 17,463 for the Puyallup Indian Reservation. Of state lands

there are altogether about 48,168 acres, and of unreserved and unappropriated government lands not more than 301 acres, leaving in the hands of private owners close to 700,000 acres, including city and town property. The census of 1910 shows 156,590 acres occupied in farm area, but with only 42,405 acres improved. The thousands of acres of rolling prairie, mentioned above, under proper cultivation, will in time yield good crops of one kind or another. Their productivity has already been demonstrated.

Prices of Land: Prairie land, depending on its contiguity to cities and depth of soil, ranges in value from $15.00 to $75.00. When close to some city its value is, of course, greatly enhanced. Logged-off land, of which there is plenty on the market, usually has a more productive soil and is worth from $20.00 to $50.00 an acre. When cleared it produces a value of from $100.00 to $250.00 an acre. Improved river bottom land or first bench land of the White, Stuck, Nisqually and Puyallup rivers, and of the Ohop, Muck and Clover creek valleys, which has proven its intense value for berry and other fruit culture, will average from $200.00 to $400.00 an acre, exceptional pieces going as high as $1,000.00. Very little of this, however, is offered for sale. The new arrival with limited means will generally do best by purchasing the crude land and developing it for himself. For the ordinary family five to twenty acres of such land will be plenty.

Soils: The character of the soil is as varied as the elevation. In general, the prairies are a gravelly or sandy loam containing considerable organic matter of an average depth of 12 inches. The low-lying logged-off land slightly elevated above the prairie land is described as the Buckley loam, or sandy muck with heavy muck or peat soil. Considerable of the table lands are composed of shot clay. The river bottoms, which constitute a large area of this county, have varying soils dependent on the detritus carried thereon, but for the most part they are alluvial muck loam, rich with decayed vegetation silted from the forests above. The depth is from a foot to twenty feet with usually a clay or sandy subsoil. Hardpan is seldom encountered.

Climate: The climate is comparable with the south of England, except that there is always less snow and range of temperature. The western half, containing the bulk of the people and improvements, is in a zone that receives an annual rainfall of from thirty to fifty inches. The United States Weather Bureau station at Tacoma reports the precipitation for 1912 as 43.58 inches and for 1911, 27.79 inches; for 1913, precipitation will be similar to 1911. The annual mean temperature for 1912 was 50.9 degrees and the total snowfall 15.7 inches. The highest temperature reached was 92 degrees on July 18th, and the lowest 16 degrees above, Dec. 27th. The last killing frost was February 28, and the first in the fall November 25. The temperature varies very little from year to year.

Resources and Industries: The unsurpassed commercial location of this region, supplemented by the best of transportation facilities, described under separate heading, together with an unlimited supply of raw material and water power, has been largely instrumental in building up a great manufacturing section. According to a cruise made in 1910, there were 345,962 acres of timber land, containing 9,853,167,000 feet of standing taxable timber assessed at $7,801,188.00, while the forest reserves and state lands will increase the quantity by at least as much more. Its many coal mines produced in 1912 about 800,000 tons, about one-tenth of which was changed into coke. Fisheries are important, there being as high as 1,000,000 pounds of halibut handled in one year over the Tacoma wharves. The development of these resources naturally causes a furthering of the agricultural interests by making necessary the products of the soil for local consumption or by facilitating their marketing in other quarters. Berry growing has probably met with greater success here than in any other county, especially in the Puyallup valley, which is also one of the most important hop raising sections in the state. Poultry raising, dairying, stock raising and truck farming are all important. The appraised valuation for all property in the county reaches the figure of $215,529,262.00.

Water: The county's mainland shore has about 18 miles of deep water frontage on Puget Sound, besides considerable more on its islands. Much of this is well suited for manufacturing purposes. The land is intersected with rivers or creeks, af-

fording ample means for proper drainage, as well as for irrigation when needed. The prairie country overlays strata of pure water, nearly always under such pressure as to produce artesian flow. As the prairie land is brought further under cultivation it is almost certain irrigation will be found profitable. There is vast water power in its streams, but thus far only a little more than a hundred thousand horsepower has been developed. It is possible to increase this as necessity demands to about eight times the amount.

Transportation: Transportation facilities are practically the same as for King county. The Northern Pacific, Great Northern, Oregon & Washington and the Chicago, Milwaukee & St. Paul systems, which include trackage rights with the Union Pacific from Portland and the Canadian Pacific from British Columbia, traverse the county and reach deep water at the extensive wharfage at Tacoma. There are altogether 399 miles of steam railroad trackage and 142.5 miles of electric line. This latter serves the main towns in the north end of the county and connects with Seattle on a half-hour schedule. Local steamboats also connect with the Sound cities and towns, while a special two-hour service is maintained between Seattle and Tacoma. Ocean-going craft clear for foreign ports. The character of the surface soil and abundance of road material make easy the maintenance of public highways suitable for the farmer's wagon or the many automobiles, and encourage their building into the furthermost recesses of the county.

Markets: Tacoma naturally serves as the chief market in the county, but other Puget Sound cities consume large portions, especially its berries, dairy products, hops, etc. The large canneries and condenseries are of great assistance, so that nothing raised goes to waste. All that can be spared from these consumers is shipped to foreign lands.

Wages: The Tacoma Commercial Club and Chamber of Commerce gives the following as the wage scale per hour in that city: Masons 70c, bricklayers 75c, plasterers 75c, tire-setters 75c, plumbers 75c, gas-fitters 62½c, steam-fitters 75c, carpenters 50c, stone-cutters 75c, painters 50c, electrical workers 50c, machinists 35c to 80c, patern-makers 40c to 50c, common labor 25c to 30c, printers about $5.50 per day. Farm labor receives from $35.00 to $40.00 per month and board. In logging camps wages are from $2.50 to $5.00 per day.

Social: The county is prominent in social grace and expression. Tacoma, of course, takes the lead, but the smaller cities and rural communities follow as conditions will permit. All have acquired superior educational, recreative and church facilities. No needs of the people are neglected while the tourist and health seekers are ministered to with many beautiful parks and resorts. Mountain recesses, pretty islands, picturesque lakes and sequestered bays are all properly utilized. The State Soldiers' Home is located at Orting, the Western Washington Agricultural Experiment Station at Puyallup, the Western Washington Hospital for the Insane at Steilacoom, and the State Historical Society at Tacoma. At American lake the annual encampment of the State Militia takes place. Of great importance are the automobile races held in midsummer on a three-mile track near the city of Tacoma and in connection with the Montamara Festo of that city. Many world's records are made and people are attracted from all parts of the west. There are 114 school districts, 29 high schools, 59 post offices, and 15 rural routes.

CITIES AND TOWNS.

Tacoma: County seat. Altitude, sea level. Population 1910, 83,743. Present estimate 102,500. About 72 per cent foreign born white. A beautiful city picturesquely located on a peninsula sloping toward Commencement bay, one of the great harbors of the world. A large manufacturing section is located on the tide flats while the business section is just above with many beautiful residences occupying the view-points beyond. Tacoma is famous for the scenic features of the surrounding country, including the Cascade Mountains with Mt. Rainier (or Tacoma) as their apex, the Olympic Mountains, an island dotted Sound, and fir clad hills. Climate is similar to other parts of the Sound country. (See county description.) This is preeminently a manufacturing city. Altogether it contains about 400 manufacturing plants, employing about 12,000 wage earners with a yearly payroll of nearly $8,000,000.00. Among the principal plants are large lumber and shingle manufacturing concerns, flour and grist mills, a large smelter, one of the largest meat packing establishments

in the west, and the most extensive wheat warehouse of the world; also machine shops, shoe factories and various wood product plants. $25,000,000.00 are engaged in manufacturing enterprises. Its jobbing business exceeds $50,000,000.00. It is one of the five largest shipping ports on the American Pacific coast and handles 42 per cent of the imports and exports of the Puget Sound district. Bank clearings for 1912 were $221,073,467.70, about three times that of ten years before. The city has 14 miles of harbor water front, four transcontinental railroad lines with several others operating over same tracks, two interurban electrics, eight transoceanic steamship lines and five coastwise steamship lines, all having regular schedules. In addition, there is the special steamer and interurban service to Seattle already noted. The city has 93 miles of electric railway, 93 miles of paved streets, and 13 fire companies with 5 vehicles, motor driven. It has the highest lift bridge in the world, costing about $550,000.00. Railroad building is extensive. A new Northern Pacific tunnel, at enormous expense, has just been completed under this city and contracts are let for expensive viaducts. About $5,000,000 has been expended in these improvements.

City owns an hydro-electric plant, costing $2,200,000 and a gravity water supply system costing over $2,000,000. Postal receipts for 1912 were $261,790. Building operations amounted to $1,876,487. There are 110 churches, 25 religious societies, two large high schools with 2,100 high school students in attendance, thirty grade schools and thirteen private schools, including seminaries, colleges and academies. 19,407 children are of school age. Occupying a natural depression adjacant to the high school is a vast open air amphitheater or stadium built entirely of concrete and having a seating capacity of 30,000. There is probably no duplication of this in the world. City owns a public library containing 63,000 volumes, and 1,120 acres of well distributed public parks. Its depot is one of the most modern and expensive in the west. There are four daily papers, twelve weeklies, five monthlies, and one bi-monthly. Annual events of great importance are the Montamara Festo, held each July, and a rose show held in June.

Puyallup: Altitude 50 feet. Population 1910, 4,969. Local estimate 6,000. In the heart of the Puyallup valley, famous as a rich berry and fruit producing district. These industries have experienced great development both in production and marketing, a large cannery making profitable use of all surplus products. The land here is cut up into small tracts which have demonstrated an earning value of over $300 an acre per year. From this station is annually shipped over a quarter of a million dollars worth of berries. City has four factories, five saw mills, a shingle mill and a creamery. Bank clearings for 1912 were $6,000,000. It has good gravity water system, electric lights, and paved streets. There are 11 churches, a high school, three grade schools, public library, two banks and two weekly newspapers. The Western Washington fair, which attracts exhibits from all parts of Western Washington is held in September of each year. Transportation facilities are numerous, including the Great Northern, Northern Pacific, and Oregon-Washington Railroad & Navigation, and Chicago, Milwaukee & St. Paul trains and electric interurbans. There are over a hundred opportunities to get in or out of the city every 24 hours.

Buckley: Altitude 80 feet. Incorporated population 1910, 1,272. Local estimate 1,500. Situated in the White river valley, thirty miles east of Tacoma, on the Northern Pacific railway. In the vicinity are active coal mining operations. It is a center of a rich plateau, suitable for berries, hops, and other products. Lumbering industry is quite important. Municipal water plant, electric lights and paved streets are enjoyed. There are five churches, a $40,000 brick high school, public library, a weekly paper, and volunteer fire department. Another railroad is expected and many indications point to future growth.

Sumner: Altitude 74 feet. Population 1910, 892. Local estimate 1,000. Situated at the confluence of the Stuck and Puyallup rivers and in the same rich berry and hop district as Puyallup. It is served by the Great Northern, Northern Pacific, Oregon-Washington Railroad & Navigation, and Chicago, Milwaukee & St. Paul railways. It is an excellent dairying district. Town has a yeast factory, fruit cannery, a shingle mill and saw mill. There are four churches, a high school, one newspaper, municipal water system, electric lights, and paved streets. Meritorious enterprises will receive help in securing sites.

Wilkeson: Altitude 835 feet. Popu-

lation 1910, 899. Local estimate 1,100. Located on a branch line of the Northern Pacific railway, 23 miles southeast of Tacoma. It is a trading post and center for an extensive coal mining region. Its chief industry besides coal mining, is the production of coke, the exports of these fuels exceeding annually 100,000 tons. Stone quarrying is also important. Town has electric lights, good water, half mile of paved streets and volunteer fire department. There are three churches, a bank and two school buildings.

Steilacoom: Altitude 40 feet. Population 1910, 430. One of the oldest settlements on Puget Sound, six miles south of Tacoma and reached by electric interurban and Sound steamers. It is a pretty water front town with a most beautiful view of the Sound, and is the home of the state's Western Hospital for the Insane, containing upwards of 800 inmates. Town has medical springs and a large sanitarium and sea bathing institution; also three churches, good schools and electric lights.

Orting: Altitude 87 feet. Population 1910, 799. Local estimate 1,000. Situated in the midst of a rich dairying and general farming section, between the Puyallup and Carbon rivers on the Northern Pacific railway, 18 miles southeast of Tacoma. Close by is the State Soldiers' Home with over 400 veterans not included in the population above mentioned. Hops and fruit do especially well. Town has a saw mill, shingle mill, cannery and bucket factory. It also has electric lights, volunteer fire department, four churches, high school, private school, and newspaper.

Eatonville: Altitude 824 feet. Population 1910, 754. Local estimate 1,050. Thirty-two miles south of Tacoma on the line of the Chicago, Milwaukee & St. Paul railway, in the fertile Ohop valley, from one to four miles wide. The region was once densely timbered and lumbering is still important. Lands are adaptable to dairying, fruit raising and general farming. Mineral deposits and much water power offer prospects for future growth. Town has a bank, Methodist church, high school, weekly paper, and paid fire department.

Ruston: Altitude, sea level. Population 1910, 780. Surrounded by city of Tacoma, but separately incorporated. A very large smelting plant is its main support. It also has a saw mill and a brick yard. Its general comforts and conveniences are similar to other parts of Tacoma.

Milton: Population 1910, 448. Situated on the prairie land east and near Tacoma for which it serves as a residence suburb. Transportation is by the Puget Sound Electric Railway. A good water supply is privately owned. Several local manufacturing industries are here. A specialty is made of truck farming and berry growing.

Roy: Altitude 316 feet. Population 1910, 315. At the junction of Muck and Nisqually valleys, in the heart of one of the oldest farming and stock raising regions of the state on the line of the Northern Pacific railway, twenty miles south of Tacoma. It is the trading post for about 700 people from the rich farming land of the vicinity. It has a newspaper, two churches, and a high school.

South Prairie: Altitude 430 feet. Population 1910, 264 with nearly 500 rural population in the immediate vicinity. It is on a branch line of the Northern Pacific railway and furnishes an immense tonnage of lumber and shingles. Much mineral, coal and clay is yet to be developed. The town is supplied with a good school and two churches. Main streets are paved.

Kapowsin: Altitude 750 feet. Population (local estimate) 600. An important lumber and shingle manufacturing town, beautifully situated on Lake Kapowsin, within 30 miles of Mount Rainier (or Tacoma), and three miles from the Stone-Webster power plant. A dozen pretty lakes are nearby. Mountain climbers leave here for a certain mountain route to the mountain. A branch line of the Chicago, Milwaukee & St. Paul railway gives good railroad service while the mountain boulevard to Tacoma is not far away. The county rock crusher and a pea cannery are here. Town has two churches and a high school, good water and electric lights.

Du Pont: Altitude about 200 feet. Population (local estimate) 500. Located on the Northern Pacific railroad, 18 miles southwest of Tacoma. A large powder manufacturing plant owned by the E. I. Du Pont de Nemours Powder Company and employing 275 men is chief support. Same company owns the townsite.

Carbonado: Altitude 1,187 feet. Population (local estimate) 1,800. A coal mining town located on a branch of the Northern Pacific railroad southeast of Tacoma. Population is quite

mixed, about 15 different nationalities being represented. Town has electric lights, volunteer fire department and good schools.

Spanaway: Altitude about 300 feet. Population (local estimate) 400. At the edge of Spanaway Lake, 10 miles south of Tacoma, with which it is connected by electric interurban. Poultry raising and dairying are important industries near by. Town has a creamery, and two churches.

Alder: Population about 350. A logging and farming center located on the Tacoma Eastern railroad and the Nisqually river.

Elbe: Altitude, 1,200 feet. A small lumbering and agricultural center of 200 people, on the Tacoma Eastern railway not far from Tacoma. It has two churches and school facilities.

Lakeview: Altitude, 272 feet. A small town of 200 people, devoted to dairying and poultry raising. Three trunk railways give service. It has a Congregational church and a grade school.

National: Altitude 1,700 feet. A saw and shingle mill town with considerable mining prospects, on the Chicago, Milwaukee & St. Paul railroad.

Sylvan: A pretty town devoted to berry growing and fruit culture. Situated on north side of Fox island. It has church and school facilities and is rapidly becoming a summer resort. Several steamers each day connect with Tacoma.

Other centers are Gig Harbor, American Lake, Rosedale, Yoman, Electron, Meridian, Alderton, Elgin, Hope, Gertrude, Parkland, Sylvan, Longbranch, Blanchard, McMillan, Benston, Bee, Fairfax, Pittsburg and Melmont.

THURSTON COUNTY.

This county marks the southernmost or upper end of Puget Sound. It has the distinction of containing the oldest settlement in the Sound country.

Topography: With the exception of a few low mountains in the west and south the surface is usually undulating or level. The rolling portion is about 60 per cent and the level about 30 per cent. Most of the drainage is toward the north into the waters of Puget Sound, a little in the south and southwest being drained into the Chehalis river. There are a number of small valleys and a few patches of ground termed "prairie land" containing from 500 to 10,000 acres each. The county is interspersed with a great many small lakes and has close to 100 miles of salt water frontage, which in some places extends nearly to the center of the county.

Population: The census of 1910 gives the county 17,581 or an increase of 76 per cent over the population of 1900. About one-third are foreign born white and the remainder native born white. The foreign nationalities chiefly represented are Germans, Scandinavians, Canadians, Finns and English. A notable increase in population has taken place since 1910.

Climate: All but a small area in the northwest of this county is in the precipitation zone of 40 to 60 inches. The precipitation in Olympia for 1911 was 39.39 inches, for 1912 it was 59.56 inches. Scarcely any snow falls and the growing period is about 170 days. Hurricanes, tornadoes, and blizzards are not known. The annual mean temperature is about 50 degrees.

Lands: The total area includes 453,760 acres, of which 151,243 acres were in 1,173 farms in 1910. In 1900 there were but 665 farms, showing the remarkable increase of 75 per cent for the decade. Altogether about two-thirds of the county is suitable for agriculture while most of the remainder is suitable for grazing and quarrying. The forest reserves amount to only 3,520 acres. Of state lands there are about 25,935 acres, leaving in private ownership about 425,000 acres. It is estimated that 60,000 acres are wood lands, 80,000 acres logged-off and 191,014 timber lands. Some of the latter is known as second growth timber lands.

Soil and Crops: The soil of the alder bottoms is a rich black loam, sometimes a deep muck; that of the uplands and prairies is shot clay and peat. It ranges from 3 to 18 feet in depth. Pears, apples, cherries, berries, root crops and grasses do particularly well and hop culture has proved successful.

Prices of Land: Unimproved land, mostly logged-off, is on the market in small and large tracts at from $12.00 to $40.00 per acre. Improved land fenced, cleared and under the plow, may be purchased for from $50.00 to

$125.00 per acre. This does not include truck gardens, very few of which are on the market. Plenty of alder bottom, suitable for intensified farming may be bought for $50.00 an acre. A little can be leased on cash terms. Twenty acres is ample for a family.

Water: In this county there is little area not drained by streams or springs, while artesian water of excellent quality is usually obtainable at from 50 to 200 feet. In spite of the great rainfall there are places on the prairies where irrigation for a short period in the summer is an advantage, especially for orchards and garden truck.

Natural Resources: The county assessor's cruise of the assessable standing, privately owned timber, shows 4,200,411,000 B. F. to which should be added the timber of state lands which are estimated at about a billion and a half. This asset will give the county many years of work on lumber and kindred industries. Next in importance at present and probably first in time to come are the agricultural lands adaptable for dairying, fruit, stock and poultry. This is also one of the few counties possessing valuable native oyster beds. Over ten million pounds of shell fish including native oysters, clams, shrimps and transplanted oysters were shipped out of Olympia in one year by one express company. Large bodies of commercial building stone and vast beds of coal exist and are being extensively worked. Saw and shingle mills dot the county.

Transportation and Markets: With 100 miles of salt water frontage, steamboat transportation is afforded many settlements. Three daily steamers run between Olympia and Tacoma, and two to Shelton. The Oregon-Washington Railroad & Navigation, the Great Northern, the Port Townsend Southern, the Northern Pacific and the Chicago, Milwaukee & St. Paul railroads traverse the county, while numerous logging and coal roads form spurs or feeders to these. An outlet from Olympia to the south will soon be provided by the Oregon-Washington Railroad & Navigation Company, which has already purchased a right-of-way and depot facilities in that city. Exceptionally good wagon roads are provided, the splendid natural drainage and unusually hard surface assisting in their preservation. There are about 48 miles of state highway in the county.

Besides the local markets, Seattle, Tacoma, Portland and the Grays Harbor cities will consume everything that can be produced.

Social Conditions: The location of the state capital in this county tends to create a cosmopolitan social atmosphere, bringing as it does all classes of distinguished people to the district. The general prosperity of the people is attested by the substantial and ornate homes, numerous automobiles and substantial public buildings. In these respects as well as in quality of schools and churches the different communities vie with each other. Art, music and literature are made the most of in social and fraternal clubs. There are 64 school districts, 12 high schools and 20 post offices in the county.

CITIES AND TOWNS.

Olympia: County seat and state capital. Population 1910, 6,996; 1900, 3,803, increase 82 per cent. Local estimate 10,000. Besides being the seat of government it is the center of a large agricultural area and is possessed of a number of manufacturing plants. It has deep water docks and several lines of steamers and small craft that reach, daily, the many small farming communities of the islands and mainland shores. The Northern Pacific and Port Townsend Southern furnish rail connections, and the Oregon-Washington Railroad & Navigation Company will build from the south. Intense scenic beauty and a lovely climate add to the attractiveness of the vicinity. The city has five miles of paved streets, six miles of electric railway, good water and light system, a paid fire department, and a city park of 270 acres. It has two creameries, one cannery, knitting mills, machine shops, boat building, saw and shingle mills, sash and door factory, extract manufacturing concern, and several steam laundries. Free sites for manufacturing enterprises are offered. It has a high school building, five grade schools, a Lutheran Seminary and a Catholic Academy; a city library, state library, federal building, state capitol, two daily and three weekly newspapers and the plant of the state printer.

Tenino: Population 1910, 1,038. Local estimate 1,200. Located in a prairie valley on the main line of three railroads and two miles from the Chicago, Milwaukee & St. Paul. It is noted for its stone quarries and has three in operation. It also has saw mills and other woodworking factories,

a creamery and electric lights. Three churches, a high school and one newspaper are supported. Its annual payroll is about $400,000.00.

Tumwater: Population 1910, 490. The oldest settlement on Puget Sound. Adjoining Olympia, on the line of the Port Townsend Southern railroad and close to the famous Tumwater Falls of the Deschutes river. Here is located an immense brewery. Electric cars connect with Olympia.

Gate: Altitude 50 feet. Population (local estimate) 500. A logging and saw mill town on the banks of the Black river at foot of the Black Hills. It is also an important railroad junction for Grays Harbor trains connecting with the main lines. Good schools are provided.

Independence: Altitude 112 feet. Population, local estimate, about 400. A logging and dairy center located on Chehalis river. It is a junction point for the Willapa Harbor and Puget Sound railways. Two churches and school facilities are provided.

Little Rock: Altitude 125 feet. Population, local estimate, 400. A shingle mill town located on the Grays Harbor railway. Two churches are supported and three years of high school work are given.

Rochester: Altitude 150 feet. Population (local estimate), 800. An agricultural and dairying center located at the junction of the Northern Pacific and Milwaukee railroads. The Oregon-Washington Railroad & Navigation Co. is a mile to the south. The town has three churches and a three year high school.

Bucoda: Population 1910, 855. A logging and coal mining town on the main line of the transcontinental railroads. It has one church, a high school and electric lights.

Other important centers are Rainier, Bucoda, Puget, Union Mills, Sherlock, Yelm, Rochester and Bordeaux.

MASON COUNTY.

This is a county that has been somewhat slow in the past to attract settlers on account of its comparative remoteness from the main traveled sections. This condition, however, is soon to be changed by the building of state highways and the coming of railroads.

Natural Features: The Olympic forest reserve, mountainous and rough, occupies one-fourth of the area in the northwestern part, and the upper reaches of Puget Sound, its southeastern boundary, while Hood's Canal forms a sort of hook in the very center. Some parts of the county are quite rolling and all has been covered with dense timber. The portions inhabited at present are near the shore line or along the river valleys.

Population: In 1910 there were 5,156 people or 1,346 more than in 1900, an increase of 35 per cent. Undoubtedly considerable growth has taken place since. There are a large number of Finns, Scandinavians and Canadians besides a few of nearly every other nationality.

Lands: Total area of the county is 930 square miles or 595,200 acres. Of this, 165,720 acres are in the forest reserve, 9,297 in Indian reservations, 40,886 acres belong to the state, while of unappropriated and unreserved federal lands only a few acres yet remain. Upwards of 200,000 acres have been wholly or partially logged-off, some of it so long ago as to now have quite heavy second growth trees. Not over 50,000 acres are included in farms and not over 10,000 acres of this are wholly cleared, thus leaving great opportunities to the future agriculturists.

Soil: In the river bottoms and estuaries of the many rivers and creeks the soil is rich alluvial loam. On the uplands it is shot clay from 6 inches to 3 feet or more in depth. Grasses and large fruits do well on the uplands, while grains, small fruits and root crops do well on the bottoms.

Prices of Land: In the southern part of the county there is plenty of cut over land offered at from $5.00 to $15.00 per acre. Land already improved is so valuable in its productiveness and earning capacity that not much is offered for sale. Some, however, in tracts containing a few acres cleared can be obtained at from $50.00 to $100.00 an acre, while highly cultivated land close to a town is worth considerably more.

Climate: The location of mountains and water areas produce a delightfully equable climate, making possible a varied vegetation and causing many health resorts and camping and hunting grounds. The annual precipitation including snowfall in the mountains is

42 inches on coast line and 60 to 70 inches back on the mountain walls.

Water: Beautiful lakes dot the interior heights. The Skokomish river tumbles tumultuously from its glacial source into Hood's Canal. Numerous other streams flow into the Sound, and springs are plentiful. Much water is at present unbridled.

Natural Resources: The latent water power, its timber reserves, its fish hatcheries, its summer resorts, its undeveloped mines, its great possibilities for stock raising, including goats and sheep, in addition to unsurpassed conditions for dairy pursuits and truck and fruit farming are among its prominent resources. The raising of grapes and peaches are profitable industries, while oyster culture also is reaching large proportions.

Transportation and Markets: Daily steamboat transportation connects the Sound and Canal landings with the large cities on the Sound. A spur of the Northern Pacific Railway Company enters the county on the south and several logging roads penetrate the timbered recesses of the interior forests, carrying their products to the main line or to the water front. Good automobile roads extend to all of the little towns and pleasure resorts. The large Sound cities take all the produce not consumed by the neighboring communities.

Social Conditions: Outside of the county seat, it may be said that most of the really social functions are performed by the summer campers who delight in this region for its exceptional hunting and fishing advantages. Lake Cushman is famous as a resort. There are 40 school districts in the county and 19 postoffices. The county seat has a three-story high school building that cost over $20,000.00.

CITIES AND TOWNS.

Shelton: Altitude 40 feet. County seat. Population 1910, 1,163. Local estimate 1,400. The only incorporated city in the county and the metropolis of the region. Located on Hammersley Inlet at the mouth of Shelton Creek with all the resources of the county to support it. Sustaining industries at present consist of lumber and shingle manufacturing, oystering, and general farming. The machine shops and railroad yards of a logging road are here. City has four churches, a high school, a private school, two grade school buildings and one newspaper. Electric lights and municipally owned water are enjoyed. Transportation is by boat to Olympia and Tacoma. Freight shipments are ferried to the rail connections.

Other towns and resorts of the county are, Union, Potlatch, Hoodsport, Dewatto and Lilliwaup on Hood's Canal; Detroit, Kamilche, Arcadia, Allyn, Grant on the Sound; and Norwood, Lake Cushman, Matlock and Mohrweis in the interior.

KITSAP COUNTY.

This county is almost completely surrounded by Hood's Canal and the waters of Puget Sound which, with the many indentations, produce a shore line of about 300 miles. It has a land area of 371 square miles with maximum elevation of about 300 feet. There are no mountains but about 60 per cent of the surface is gently rolling and the rest level, divided up into various fertile valleys, benches and plateaus. There are few steep places even near the water front, which in many localities supply ideal beaches for swimming or bathing and pretty spots for the summer homes of city dwellers.

A large portion of the land area is taken up by Bainbridge island, about 9 miles in length and one to 4 miles in width. On it are located many summer homes, camping grounds, mill towns, and ranches. Several smaller islands are also in the county.

Population: The census of 1910 gives the county 17,647, an increase of 161 per cent in ten years. A small majority are American born, the remainder being mostly newly arrived Scandinavians who nearly dominate some localities, also a large number of German and British subjects, some Finns, Icelanders, French, Danes, Hungarians and a scattering of other nationalities.

Lands: In 1910 of the total area of 237,440 acres, only 42,332 were in farms, and only 9,161 acres of this were improved. There are altogether about 75,000 acres of logged-off land and about 42,788 acres of timber land. The state holds 12,277 acres. 7,287 acres are included in the Port Madison Indian reservation and about 1,304 are in military reserves.

Soil and Crops: The land is exceedingly fertile. All is adaptable to some sort of culture. Hay, berries

including cranberries, potatoes, and other root crops attain extraordinary yields. Fruit does well and dairying is very important. The soil is generally sandy loam and shot clay with some rich alder bottom.

Prices of Land: Prices of unimproved land of which there is considerable, is quoted at from $10.00 to $60.00 per acre with terms very favorable. The cost of clearing and grubbing varies from $50.00 to $150.00 per acre. Land cleared and under cultivation is worth $100.00 and upwards per acre according to quality of soil, extent of improvements, and accessibility to landings and markets; none of it, however, is more distant than six miles from these facilities. Many settlers have become wealthy from the profits of land worth the above prices.

Climate: Since the county is practically surrounded by sea water and the elevation averages 100 feet, the air is delightfully tempered and kept pure and fresh. The rainfall for 1911 was 24.6 and for 1912, 38.77 inches. Three-quarters of it falls from November to May and the remainder usually falls at such intervals as to insure good crops.

Resources and Industries: Besides its rich lands adaptable for agriculture, the county has between one and two billion feet of standing timber that for years to come will maintain many a large logging camp and lumber mill. Fishing supports many while much prospecting for petroleum is at present being carried on. Poultry raising and truck farming are specialties on account of ideal conditions, proximity of big markets, and cheap transportation. Sheep, cattle, and hog raising are becoming important. Some manufacturing is carried on especial of lumber and wood products. At Eagle Harbor are a shipyard and creosoting plant.

Water: Some irrigation is practiced in orchards and in truck farming but is not generally needed. The county is veined with small streams and springs, and wells are easily obtained at shallow depths. Water for domestic purposes is pure, soft and abundant, while sulphur springs cause numerous health resorts. No water power sites are at present being utilized although the McKenna Falls would be suitable to furnish light and power to the entire county.

Markets and Transportation: The local markets of Bremerton, Port Orchard, Charleston, and Manette, consume a great deal of the farm produce, while any surplus goes to Seattle and Tacoma or is marketed abroad. Three rival steamboat lines make round trips from all landings to the large cities of the Sound at fares seldom exceeding one cent per mile. Good roads intersect all parts of the county and are passable the year round. There are no railroads in the county.

Wages: Are practically the same as across the Sound for common and skilled labor. Milkers command $40.00 to $50.00 per month. Mill hands receive from $2.25 to $2.75 for common labor, while mechanics get from $3.00 to $7.00.

Social Conditions: The county is well supplied with schools, churches, traveling libraries, postal service, and grange halls. The villages are connected with each other and with the cities by telephone and cable. Literary and musical clubs are features of the community life. People are generally well to do. Seattle and Tacoma being so easily reached have much influence on the social life. There are 40 postoffices, 61 school districts and 9 high schools.

CITIES AND TOWNS.

Port Orchard: (County seat.) Altitude, tide level. Population 1910, 682. Local estimate 1,200. An exceedingly pretty town on a bay of same name. It is one mile distant, and across the bay, from the United States Puget Sound Navy Yard from which it derives considerable support. The chief industries are shingle mills, a creamery and a machine shop. It has an excellent waterworks system, good schools, including a high school, three churches and other public buildings. The Washington Veterans' Home is located here.

Bremerton: Altitude 50 to 200 feet. Population 1910, 2,993. In 1900 it was part of town of Charleston. This is most noted for being the base of the United States Naval Station of Puget Sound, with its huge dry docks and immense payroll, employing about 1,500 men. City has good waterworks, electric lights and telephone service, one high and two grade schools, eight churches, substantial public buildings, two newspapers, public library and public park. Here is held the annual County Fair in September and Rhododendron Festival in May. It occupies a beautiful scenic position on Port

Orchard Bay and is the social center of the county.

Charleston: Population 1910, 1,062. Local estimate 1,600. It is contiguous to Port Orchard and Bremerton and adjoins the naval reservation from which its main support is derived. It has grown rapidly since its incorporation in 1903 and is at present well supplied with public utilities. It has two churches, a high school and weekly paper, also electric lights, water system, and volunteer fire department.

Poulsbo: At the head of Liberty Bay with a population of about 400. It is really the supply point and social center for over 1,500 people. Its main industries are lumber manufacturing and cod fish canning. Poultry raising is also important. It has one newspaper, a high school and three churches. About twenty-five business institutions are represented. Transportation is by boat.

Manette: Altitude about 100 feet. Estimated population 600. A pretty town across from Bremerton and surrounded by fruit and chicken ranches. A ferry connects with Bremerton every 45 minutes. Seattle steamers stop here. Good church and school facilities are enjoyed.

Brownsville: Altitude 50 feet. A saw mill town close to the Sound. Church and school facilities are sufficient. Water transportation.

Colby: A lumber and shingle town of about 500 people, located on Yukon Bay of Puget Sound. Two boats run daily to Seattle. Town has two churches, a high school and one private school. Many cedar poles and much pile timber are cut here.

Port Blakeley: Population (local estimate) about 400. A saw mill town prettily located on a small bay on the east side of Bainbridge island just across from Seattle. It has a box factory, a ship yard, two churches and ample school facilities.

Rolling Bay: Altitude 140 feet. A summer resort for Seattle people and located on the east side of Bainbridge island. Two boats touch here daily in the winter and four in the summer. Town has two churches, a newspaper and good schools.

Tracytown: Altitude, sea level. A farming center located on Port Washington Bay, with pretty beaches, camping grounds, and woods surrounding. Steamers make three round trips to Seattle daily. Church and school facilities are ample.

Other important centers are Waterman, Silverdale, Nellita, Manchester, Lofall, Creosote, Burley, Chico, Keyport, Seabeck, Crystal Springs, Bangor, Olalla, Port Gamble, Port Madison, Eagle Harbor, Glenwood, besides many other prosperous little villages and mill camps.

JEFFERSON COUNTY.

This is one of the counties forming the Olympic Peninsula. It has the Pacific Ocean for its western boundary and Puget Sound for its eastern. It contains approximately 1,920 square miles of land about 1,200 of which are included in the great Olympic Forest Reserve. The heart of the region, a very rugged and mountainous section of nearly 100,000 acres, constitutes the Mount Olympus National Monument and so is closed temporarily to all development. Across it extends the snowcapped Olympic Mountains, while Mount Olympus, towering as a silent sentinel 8,131 feet, is a mecca for many a tourist band of mountaineers' daring intimacy with one of nature's masterpieces. Emulating this in ruggedness is Mount Constance 7,777 feet in height.

Population: In 1910 there were 8,337, an increase of 22 per cent over the census returns of 1900. Most of the people are in the eastern end of the county and occupy the penninsula formed by Puget Sound, Hood's Canal, and Discovery Bay. The rest are scattered along the shores of the canal and in the valleys formed by rivers flowing into the Pacific Ocean. Many nationalities are found here on account of Port Townsend being the Puget Sound headquarters for a number of United States departments.

Lands: The total area of the county is 1,118,080 acres, of which the Olympic National Forest takes 730,080 acres, Indian reservations 640 acres, Military reservations 4,887 acres, unappropriated lands 427 acres, and State lands 73,150, leaving less than 300,000 acres for private occupancy. Of this in 1910, 31,518 acres were in 5,712 farms, containing 6,554 improved acres, the average improved land per farm being 25 acres. Numerous streams from the timbered mountains have deposited a rich organic soil in the small deltas and valleys formed by the rivers. On

these and the rolling uplands that have been redeemed from the forests nearest the water are the agricultural and dairying activities of the county.

Prices of Land: Unimproved land will cost from $10.00 to $50.00 and upward, while the improved will cost $100.00 to $300.00 and up according to soil, location and nature of improvement.

Natural Resources: The resources are greatly varied and practically untouched. The mountains contain many billions of feet of first class timber reserved and many billions more privately owned. The timber here is remarkably thick, running as high as 50,000 feet for a single acre. There are also numerous districts containing gold, copper, silver and other precious metals, open for entry but so far very little worked. It is believed large oil fields exist and they are being prospected. The waters teem with fish which keep large canneries busy at various places. Immense lumber and shingle mills are devouring the products of numerous logging camps. There is no limit to the possibilities for the dairy and stock business, while the scenic, sanitary and climatic conditions are building up health and tourist resorts. This is also a good locality for the poultry industry. Pure water is abundant everywhere and thousands of horse power are running to waste.

Transportation: The Port Townsend Southern runs 26 miles south to Quilcene. The Milwaukee system will probably connect with this from its main line in Thurston county while the Northern Pacific Railway Company is planning to tap the valuable resources in the west by extending the Grays Harbor branch northwest from Moclips, Chehalis county. A permanent State Highway that will entirely circle the county has been authorized. Good wagon roads reach all those portions now inhabited. The Inland Navigation Company furnishes three vessels daily to Seattle, Bellingham and peninsular points.

Markets: All surplus products find a ready market at the large Sound cities, but practically all the farming and dairy products are consumed by the cities and towns of the county and the logging and fishing camps, military forts, and resorts. Shingles are scowed across the Sound and most of the lumber is loaded onto deep sea vessels for foreign markets.

Wages: The usual wages for farm labor are $30.00 to $35.00 per month and board or $2.00 to $2.50 a day without board. The general common labor wage is $2.50. Skilled workmen get $3.00 per day and upward. "Stranders" from the mills and fisheries supply the usual demands except at harvest time.

Social Conditions: In the isolated districts social development would naturally be backward but, in the cities and towns near the water and easily accessible, advancement is made in the esthetic as well as in the necessities. Schools and churches are maintained wherever needed and general hospitality obtains throughout the region. The resort features attract many outside people. There are 30 school districts and 23 postoffices.

CITIES AND TOWNS.

Port Townsend: County seat. Population 1910, 4,181; 1900, 3,443. Increase 21.5 per cent. Located on Quimper Peninsula at the entrance to Puget Sound. It is the metropolis of the county and headquarters for Puget Sound of the United States Coast Artillery, Revenue Cutter Service, Marine Hospital Service, Quarantine Service, and Hydrographic Service. It has a municipal water works, sanitary sewers, gas and electric lights, and telephone, cable and wireless communications. Its principal industries consist of two salmon canneries, a fertilizer manufacturing plant, saw mill, a brewery, and several wood working plants, including a boat building works. It has a four-year high school, seven churches, a public park, and one daily paper. Transportation is chiefly by steamer, although 26 miles of railroad extend to Quilcene.

Chimacum: Altitude about 180 feet. Located at the mouth of Chimacum valley. A wonderful dairying section. It is famous for registered Holstein Friesian cattle, some of which hold world records. Church and school facilities are ample.

Clearwater: Altitude 150 feet. A fishing, farming and timber center, located near mouth of Clearwater river. Nearby are oil and mining prospects. Good school facilities exist. Transportation is by boats. The Northern Pacific railroad comes to Moclips some distance to the south.

Fairmont: Altitude 10 feet. A shingle and lumber mill town located on Port Townsend Southern railway 12 miles from Port Townsend. Many fish are caught in vicinity and the

agricultural land has possibilities. A good school is maintained.

Hadlock: An agricultural village located at head of Port Townsend Bay. An alcohol distillery plant is here. School work extends through the 10th grade.

Port Ludlow: Population, local estimate 600. A saw mill town beautifully located overlooking the Sound. Good school facilities are provided. Townsites and improvements are owned by the Puget Mill Company.

Quilcene: Population (local estimate) 600. A lumber and fishing town located at the terminus of the Port Townsend Southern railway. Three steamers a day to Seattle. Farm lands, mineral lands, and oyster lands are adjacent. The United States fish hatchery is located here. Town has two churches, a high school and weekly paper.

Other agricultural centers are Coyle, Leland, Shine, Spruce, Irondale, Brinnon, Duckabush, Port Discovery, Fort Flagler, Hoh and Center. At Irondale is the only Pig iron plant in the state.

CLALLAM COUNTY.

The Strait of Juan de Fuca and the Pacific ocean bound this county on the north and west giving it about 150 miles of waterfront and a number of splendid harbors. The entire central and southern area is occupied by the Olympic Forest Reserve, which includes also a portion of the Mount Olympus National Monument. The occupied and cultivated lands lie along the strait and coast shores. Much of the county is rugged and mountainous and all has been densely timbered. There yet remain fifteen billion feet of uncut timber on private holdings and as much more in the great forest reserve.

Population: The 1910 census gives 6,755, but the influx since has been rapid because of several large activities. There are probably over 10,000 now. Of the foreign born, Scandinavians, Swedes, Norwegians and Germans are in the lead. Dutch and Swiss take naturally to the agricultural features.

Land and Soil: Of the entire 1,104,640 acres within the limits of this county, 530,480 acres are included in the forest reserve, 24,517 acres are in three Indian reservations, 2,200 acres are unreserved and unappropriated federal lands while 73,086 acres are state lands. The forest reserve contains practically all of the mountainous land although there is some precipitous area near the water. On the plateaus or along the streams, however, further back from the coast and especially toward the northeast, considerable level or rolling land may be found. This is very rich and capable of intensive cultivation. The 1910 census showed 62,248 acres of farm land in occupation with only 16,708 acres of it improved in 607 farms. The soil is from one to ten feet deep, very rich and best adapted to hay, grasses, fruits, berries and dairying.

Prices of Land: Most of the cut over land is held by large owners, but near Sequim and Port Angeles there is considerable in small holdings which may be purchased at from $10.00 to $25.00 for logged-off and unimproved and $75.00 to $250.00 for improved, its productiveness making these values reasonable.

Wages: The prices given for farm work are $35.00 to $40.00 per month and board. $2.50 to $3.00 is the prevailing wage for unskilled workmen and $3.50 to $6.00 per day for skilled workmen. Mill construction, railroad building and fishing are lines that employ much labor.

Climate: The climate is mild and equable and the precipitation varies from 120 inches in the southwestern corner to less than 20 in the northeastern. As a whole the climatic conditions are so favorable as to make the northern shores and inland lakes famous as health resorts. Even in the rainy region there are more sunshiny than cloudy days, the heavier rains taking place in the winter months. There are no extremes of heat or cold and seldom any lightning or thunder.

Irrigation: On account of the comparatively small rain fall in the northeastern part of the county and the rather gravelly nature of the soil, irrigation has been tried and found very beneficial, especially at Sequim, where the largest single body of irrigated land in western Washington is to be found.

Resources: For many years the vast timber resources will provide many industries, but fishing and the packing of fish—now a considerable industry, may ultimately supersede it.

Both industries—if the mountainous land is reforested, and the propagation of fish proves successful—will be everlasting in this county. Dairying and cattle raising on the immense area of logged-off lands may reach large proportions. A million dollars worth of these products was marketed in 1912. It is known that the county is highly mineralized and there are surface indications of oil, but so far no values have been obtained although much prospecting is now being done. With the advent of the railways, which are now building, manufacturing will be carried on extensively. Already almost every little port contains its lumber and shingle mill and preparations are now under way to meet increased transportation facilities in a large way by furnishing plenty of tonnage. Water power is extensive and very little developed. Seven miles west of Port Angeles on the Elwah river is the Olympic Power Company's plant, the initial installation of which will develop 6,000 K. V. A. at 100 head. This plant will supply power to Port Angeles, Port Townsend, Bremerton, Fort Warden, Fort Flagler and the United States Navy Yard at Bremerton.

Transportation: The county at present has no railway outlet, but this defect will soon be remedied as the Milwaukee system is now building in and the Northern Pacific railway is expected to do so. There are several small logging roads and one ten miles in length from Port Crescent to large timber holdings. The passenger and freight work is done by competing steamboat lines out of Seattle which touch all landings in the strait, and by some craft that ply the Pacific coast beaches. A state highway is designed to girdle the Olympic Peninsula.

Social Conditions: The rural towns are provided with schools and the county seat with a four-year high school. Nearly all religious denominations are provided with churches. There are some mountain and lake resorts that are patronized mostly by people from the Sound cities and by tourists. A fruit fair is held in August and a rose carnival in July. There are 46 school districts and 22 post-offices.

CITIES AND TOWNS.

Port Angeles: County seat. Population 1910, 2,286. A rapidly growing and progressive town, situated on a commodious and safe harbor in the strait, with the towering Olympics at the rear. With enormous quantities of standing timber behind and teeming fish in front, every reason for large industries exists. It already has a number of saw and shingle mills and other wood working industries while the building of one of the largest and most modern lumber mills in the world is under way. It has waterworks and electric lighting system, a high school and four grade schools, eight churches, a volunteer fire department, three weekly newspapers and a large brewery. It is preparing for the advent of the railways by improving its harbor front at great expense.

Sequim: Altitude 140 feet. Population (local estimate) 400, and 2,000 in voting precinct. Located in northeastern part of the county three miles from salt water and on line of new railroad now building. General farming and dairying are very important in the neighborhood. Town has two saw mills, three shingle mills, two large creameries, and clam and fruit canneries. Three churches, a high school and weekly newspaper are maintained. An irrigation festival is held annually. Present transportation is by steamboat.

Dungeness: Altitude 10 feet. A village of about 200 located in the midst of a rich dairying section. Steamboat transportation. High school and a Methodist church.

Port Crescent: Altitude 230 feet. A small village devoted to lumbering and kindred industries. The country near is attractive to tourists. Dairying, general farming, and fishing are important.

Neah Bay: An old Indian village in the northwest corner of the county within the Makah Indian reservation. Many fishermen are here in the summer time. One fish cannery is operated.

Other centers are Sol Duc, a famous resort, Bever, Forks, Gettysburg, Mora, Port Williams, Clallam Bay, Quillayute and Blyn.

SOUTHWEST WASHINGTON.

CHEHALIS COUNTY.

This county occupies the central space within the tier of counties bordering directly on the Pacific. It has 60 miles of ocean beach and an area of 1,927 square miles including the Quiniault Indian Reserve, which, together with the southern fringe of the Olympic Forest Reserve, takes fourteen of the northern townships.

Natural Features: A large proportion of the county is fairly level and is intersected by many streams, the most important of which is the Chehalis river, crossing from the east and navigable to the center of the county. Other smaller rivers are the Humptulips, Hoquiam, Wishkah, Wynootche and Satsop, paralleling each other from the north and draining the larger part of the county into Grays Harbor or the Chehalis river. Grays Harbor has an area of 97 square miles and is navigable to vessels of 20 feet draught. The whole county was once densely timbered, the uplands with fir, spruce, cedar and hemlock, and the river lands with cottonwood, larch, maple and other soft varieties.

Population: The 1910 census gives the county 35,590 and the 1900 census 15,124, showing an increase of 137 per cent. The people are in large majority native born Americans. Swedes, Norwegians and Germans make up the bulk of the foreign born element. Most of these, however, had acquired our language and habits in other states before coming to the county.

Land and Soil: The total area is approximately 1,233,280 acres, of which 65,190 acres are state lands and 168,280 acres are forest reserve. It is estimated that over eight billion feet of timber has been removed, producing about 200,000 acres of logged-off lands, and that such area is increasing at the rate of 20,000 acres annually. Including this and the bare river bottoms, there have been redeemed altogether not over 85,000 acres of farm area. Not more than 27,000 acres of this are highly improved. A large portion of the country is fairly level or gently rolling, while much rich bottom land has been formed in the valleys of its many streams. When cleared, nearly all this will prove to be choice agricultural land.

Soils: The soils here are a dark vegetable loam, best adapted for soft grains, hay and vegetable farming; the uplands of the rolling prairies consist of shot clay and enriched fern soil, ideal for fruits, berries and dairy forage, including alfalfa. Near the tide water is considerable rich cranberry marsh, a few acres of which have already been cultivated. A larger area is at present being prepared for this industry. Upon the elevated stump land thousands of sheep and goats could be turned loose with profit both to the sheep and to the lands. For intensive farming or horticulture, 10 to 20 acres is ample.

Prices of Land: Much unimproved land can be bought as low as $10.00 per acre, but that nearest to towns and railroads will run considerably higher, sometimes up to $50.00. Improved lands would have the added cost of the improvements. River bottom in seed for hay is worth from $100.00 to $225.00. Bench land suitable for crops brings $50.00.

Climate: A study of the climatological table will show that this county gets plenty of rainfall. The rains are usually warm while the greater precipation is in the winter months and close to the ocean. The annual mean temperature for 1912 was 49.8 in Aberdeen. The summer weather is considered ideal, while the winter rains prove healthful and invigorating. One can engage in outdoor employment practically the entire year. Pure water for domestic purposes is plentiful.

Natural Resources: Forest products and the manufacturing therefrom will constitute the main sources of revenue for decades to come. With reforestation such resources may be made interminable. Ultimately, when the growth of alfalfa is understood, the ground will yield even greater values in the form of forage and animal products. All domestic animals thrive; mountains, lakes, and streams are alive with game and fish. The ocean is a store house of wealth, yielding millions of salmon yearly. The annual output is worth about $250,000.00. Oysters, clams and crabs produce large revenue and here is the only whaling station in the United States,

which in 1912 yielded 210 whales worth over $500,000.00. As a seaport and ship building center it will always take front rank. Strong evidences of petroleum and coal indicate another fruitful resource. Pleasure and health resorts are numerous.

Timber: A recent cruise of timber still standing on public and private lands gives the following enormous figures in board feet: Fir, 13,007,540,642; spruce, 1,754,230,180; cedar, 3,153,394,157; hemlock, 2,719,231,034; balsam fir, 63,124,750; pine, 16,027,600; larch, 15,790,500; cottonwood, 3,055,500. In addition, the dead standing fir amounted to 732,354,200 B. F., and prostrate good timber 795,299,746 B. F., while the cruisers' rough guess estimated the forest and Indian reserves to contain 14 billion feet more of merchantable timber. This is one of the most densely timbered counties in the state.

Markets: Its own large cities afford ready markets for nearly all the land products of the county. Most of the lumber goes abroad and its shingles by rail to eastern states. It is not yet producing enough animal and poultry products for its own needs. Fish, crabs, clams, fruit and vegetables preserved by its canneries are either locally consumed or easily marketed.

Social Conditions: The pioneer work of the county has been accomplished and it has entered that period of civilization when the higher social advantages are appreciated. Modern schools, churches, libraries, parks, hospitals, banks, theatres, club buildings, fraternal societies and other christianizing and civilizing institutions are generously provided. There are 34 post offices, and 58 school districts.

Transportation: The principal cities and towns are reached by the Northern Pacific, the Oregon-Washington Railroad & Navigation and the Chicago, Milwaukee & St. Paul main lines. Regular packet steamer lines connect with California ports; numerous coastwise passenger and freight vessels run between all coast points, while a fleet of timber carrying schooners, and tramp vessels of various kinds go to nearly all parts of the world. The harbor cities are connected by an electric trolley system and the interior towns by excellent roads, the natural drainage of the county lending itself to the preservation of highways. The Olympic highway will traverse nearly a hundred miles of the county.

Labor and Wages: The large industries of the harbor cities; the fishing and packing of fish; the public improvement activities, in addition to the requirements of husbandry, create a healthy demand for labor. Unskilled labor receives from $2.00 to $2.75 per day and skilled from $3.50 to $8.00. Milkers get $35.00 to $50.00 per month with keep, and harvesters from $2.50 to $3.00. Fishermen will usually net from $1,000.00 to $2,000.00 per year.

CITIES AND TOWNS.

Montesano: (County seat). Altitude 65 feet. Population 1910, 2,488. Local estimate 3,000. At the head of navigation on the Chehalis river and on the line of all the railways that traverse the county. It has two saw mills, a planing mill, three shingle mills, a condenser, incubator factory, one high and three grade schools, eight churches, two newspapers, three miles of paved streets and a half million pay roll.

Aberdeen: Altitude 15 feet. The metropolis of the county. Incorporated. Population 1910, 13,660; 1900, 3,747; increase, 251%. Local estimate, 17,500. Located on Grays Harbor in one of the richest timber sections of the state, the lumber industry gave it a great impetus forward. Its future advancement is assured not only from further development along this line, but also from the growth of the surrounding rich farming country suitable for dairying, general farming, and fruit growing. It has saw and shingle mills, fish canneries, sheet metal works, sail lofts, cigar factory, two ship building plants, a flouring mill, brewery, a gas and electric light plant, street car system which connects with adjoining towns, forty-five miles of paved streets, a public library, gravity water system and sanitary sewers, a paid fire department, a daily paper, two weeklies, two monthlies, and one semi-weekly. A high school and six grade schools, ten churches, a Y. M. C. A., splendid club buildings and fifty fraternal lodges are maintained. Train service is supplied by the Northern Pacific, Chicago, Milwaukee & St. Paul and the Oregon-Washington Railroad & Navigation railroads.

Hoquiam: Altitude, 14 feet. Population 1910, 8,171; 1900, 2,608; increase 213%. Local estimate, 11,000. On

Grays Harbor. In resources and future prospects it is similar to Aberdeen close by, and with which it is connected by trolley cars and all railroads. It has paved business streets, sewers, waterworks, gas works, electric lights, paid fire department, telephone, commission form of government, public parks, a library, ten churches, a high school, four grade schools, one Catholic school and one daily and one weekly newspaper. There are altogether sixteen manufacturing concerns, including very large lumber and shingle mills. Principal industries are logging, fishing, salmon and clam packing, whaling and ship building. It has a Y. M. C. A. building, two banks, three theaters, and is building a $125,000.00 high school. Transportation facilities are the same as for Aberdeen.

Cosmopolis: Altitude 15 feet. Incorporated. Population 1910, 1,132; 1900, 1,004. Local estimate, 1,500. Across the Chehalis river from Aberdeen and connected with it by trolley. It is served by the Milwaukee, the Oregon-Washington Railroad & Navigation, and the Northern Pacific railroads. Its principal industries are lumbering, salmon packing, and farming. It is also a shipping port for coast wise schooners. It has two churches, a high school, one newspaper, paved streets, electric lights, water works, and a fire department.

Elma: Altitude 75 feet. Incorporated. Population 1910, 1,532; 1900, 894; increase, 71%. Local estimate, 1,532. Located in the rich farming district of the Chehalis valley and reached by all main line railways. At this point a logging spur of the Northern Pacific railroad leads north into Mason county. It has a bank, one weekly paper, a fire department, good schools and seven churches. The county fair grounds are here and the fete is held annually in October. This is the center of a large dairy region and has the only fruit growing association and fruit cannery in the Grays Harbor country. Free factory sites are offered.

Oakville: Altitude 78 feet. Population 1910 census, 465. Local estimate 600. Located in the Chehalis river valley on the line of the Northern Pacific and Chicago, Milwaukee & St. Paul railroads. Fertile prairie lands are all around, while much timber is in the immediate vicinity. Principal industries are lumber and shingle manufacturing and shipping of Cascara bark. Fifty thousand pounds of this are shipped annually to New Jersey. Its average selling price is 6½ cents per pound. Town has three churches, high school and weekly paper.

Westport: Altitude, sea level. Population estimated at 250. A summer resort located near the entrance to Grays Harbor. The Grand Army of the Republic for the Department of Washington and Alaska hold their annual summer reunions here. The Northern Pacific railway runs two trains daily to Bay City, two miles away. The fishing industry is important, and a large clam packing establishment is maintained.

McCleary: Population (local estimate) 900. Big Lumbering interests are here. Town has a saw mill, two shingle mills and a sash and door factory, also a Methodist church, and a four room grade school. Surrounding country is rich in agricultural possibilities. The Northern Pacific trains supply transportation.

Junction City: Altitude 15 feet. Population (local estimate) 400. Located on the Chehalis river with deep water frontage available. The Northern Pacific railway furnishes daily passenger service. The Olympic highway passes through the village. Good bottom lands highly adaptable to truck gardening are near. School facilities are ample.

Melbourne: Altitude 18 feet. A farming and logging center served by the Oregon-Washington Railroad & Navigation and Chicago, Milwaukee & St. Paul railways; also by the Chehalis river. Village has a grade school.

Other principal towns of the county are Moclips, Satsop, Humptulips, Ocosta, Bay City, Aloha, Quinlault, Markam and Lone Tree.

PACIFIC COUNTY.

Pacific county, situated in the extreme southwestern part of the state, overlooks the great Pacific ocean on the west, while its southern boundary is formed by the Columbia river and the county of Wahkiakum. The general slope is toward the west and the elevation varies from tide level to about 1,500 feet. Ten small rivers carry most of its drainage into Willapa

Bay, which covers about 150 square miles of additional area lying practically within its limits. The entire land area is 895 square miles, a large portion of which is of a rolling nature. The greater portion of the county is still covered with valuable timber.

Population: The 1910 census credits the county with a population of 12,532, representing an increase of 109.5% over that of 10 years previous. A decided growth has continued since that enumeration, especially within the cities of South Bend and Raymond. Americans predominate, with Scandinavians, Germans, Finns and Greeks following in the order named.

Lands: Of the 572,800 acres of land within the county 54,202 acres are state lands, while the remainder, excepting a few acres of Government land, has passed into the hands of private owners. Not included in the above area there are, on Willapa Bay and its tributary rivers, about 25,000 acres of rich tide lands suitable for agriculture, and 15,000 acres of oyster grounds. Of the other lands not more than 50,000 acres are in farms. Altogether about one-half of the county is suitable for agriculture. The other portion would be valuable for pasturage. The peninsula forming the western bounardy of Willapa Bay is flat and low and contains between 3,000 and 4,000 acres adapted to cranberry culture, an industry which bids fair to increase in importance. Much of the best agricultural area is either bottom land or bench land.

Soil: The soil in the valleys is a rich sandy loam. On the benches it is a black loam comprised largely of a vegetable decay accumulated for thousands of years. It is from one to fifteen feet deep and has a subsoil of yellow or blue clay. The tideland soil is black loam mixed with vegetable decay.

Prices of Land: Unimproved land may be purchased at prices ranging from $5.00 to $40.00 per acre. Improved, it will cost from $100.00 to $250.00 per acre. From ten to twenty acres of the best land makes a nice little farm for the usual family. Lands may be leased for one-third of the product or on a cash rental basis.

Resources and Industries: The chief resources of the county are wrapped up in its heavy timber, its oyster and salmon fisheries, and in its fertile dairying and truck gardening lands. About 350,000,000 feet of lumber is manufactured yearly, while the standing timber amounts to about 13,000,000,000 feet. A million dollars worth of oysters and $150,000.00 worth of salmon are fished yearly. Dairying and truck gardening each produce about $100,000.00.

Water: The water supply for domestic use is practically unlimited and of excellent quality. The streams having a known horse power for manufacturing enterprises are: Nasel, 5,000; North, 2,000; Smith, 1,000; South Fork of the Willapa, 700; Palix, 700; Willapa, 500. The other streams all carry large volumes of water, but the horse power has not yet been determined.

Transportation and Markets: The Northern Pacific railroad branch line from Chehalis to Raymond and South Bend is the chief railroad. The Oregon-Washington Railroad & Navigation Co. has a short line extending from Megler, in the south end of the county, to Nahcotta, serving some nineteen ocean beach summer resorts. Steamers connect with trains at Megler for Portland and Astoria and at Nahcotta for South Bend and Raymond. The Chicago, Milwaukee & St. Paul has commenced a branch extending from Independence to Doty and thence to the harbor. Daily steamers connecting all bay points furnish transportation for the southern portion of the county, while ocean going vessels carry cargoes to California and foreign countries. County roads, good at all seasons of the year, extend in various directions, while the National Park Highway, a state primary road, will soon be built from the southwest into Lewis county. The main products enumerated are sold in the markets of the world, while Raymond and South Bend consume practically all the dairy and farm products at the present time.

Wages: Wages paid for farm labor, including board, range from $40.00 to $60.00 per month, while the prevailing price for the same labor without board is from $2.25 to $2.50 per day. Carpenters get from $4.00 to $6.00 a day and other skilled workmen from $3.00 to $5.00, the usual compensation for ordinary unskilled labor running from $2.25 to $3.00.

Social Conditions: Churches of various denominations have been established wherever needed and public libraries are maintained in the larger centers. There are 48 school districts and 28 post offices. Telegraph and telephone service is ample. A county fair is held annually and stimulates

scientific farming. The famous North Beach line of summer resorts, covering 28 miles of ocean beach, attract thousands of people every summer to enjoy the ocean surf or the pleasures attendant upon bathing, boating, fishing and clam digging.

CITIES AND TOWNS.

South Bend: County seat. Altitude, tide water. Population 3,023 (U. S. census 1910). Local estimate, 4,500. American and Scandinavian. Located at the head of deep water navigation on Willapa Bay and the Northern Pacific railroad. Steamship service to San Francisco, Hawaiian Islands, Hong Kong, etc. The main industries are manufacturing and dairying. The recent improvements made by the Government on the harbor bar will prove an important factor in the upbuilding of this city as well as the sister city, Raymond, and other towns located on the bay. There are now in active operation three large saw mills, several shingle mills and salmon canneries, an iron and steel works, a boat building establishment, three oyster opening and canning plants, a cigar factory, a furniture and cabinet works, an ice manufactory and bottling works, and a box factory. The monthly payroll is from $40,000.00 to $60,000.00. Churches of all denominations, one high and two grade schools, a free public library, a t legraph and telephone system and two weekly newspapers are supported. The leading thoroughfares are paved and the walks concrete. Free sites are offered for factories of merit. An electric railway connects with Raymond.

Raymond: Altitude, tide water. Poulation 2,450 (U. S. census 1910); local estimate, 5,500. American and Scandinavian. Transportation facilities identical with those of South Bend. This is a young city scarcely six years old and built up chiefly by the lumber industry. It already has many manufacturing enterprises with a large yearly payroll. Among these are six saw mills, four shingle mills, two veneer plants, a sash and door factory, a ship yard, a foundry, machine shop and a boiler works. Manufacturing sites are free and there is plenty of room for plants to manufacture various wooden utensils out of raw material now going to waste. There are four churches, one high and four grade schools, also a free employment bureau. Two weekly papers and a volunteer fire department are supported. Streets are paved or planked and an electric car line connects with South Bend, which city it resembles in future possibilities.

Ilwaco: Altitude sea level. Population (1910 census) 664. Local estimate 850. Located on Bakers Bay at mouth of Columbia river. Summer resorts and cranberry and dairy lands are tributary. Oregon-Washington Railroad & Navigation trains run daily and many steamers reach this town from Portland and Astoria, Oregon. The principal industries, in addition to the summer resort features, are fishing, logging, farming, stock raising, fish canning and fruit raising. City has ample church and school facilities and supports a weekly newspaper.

Frances: A logging town with a population of about 300 and located on the South Bend branch of the Northern Pacific railroad. It has a three year public high school and a Catholic church and school.

Oysterville: A fishing town located on the peninsula 3½ miles from the Oregon-Washington Railroad & Navigation railroad. Fish, clams and oysters are canned here.

Nasel: A small village in the midst of a timber region on the Nasel river and accessible by small launches and a wagon road to Knappton. It has two churches and school work up to 10th grade.

Nahcotta: An oyster village located on the peninsula at the terminal of the Oregon-Washington Railroad & Navigation railway. Daily boats connect with South Bend and Raymond.

Long Beach and Breakers: Ocean summer resorts on the peninsula. The O. W. R. & N. trains connect with Columbia river and harbor steamers. The towns have electric lights and school and church facilities. Hotels are attractive and contain all modern conveniences.

Other centers, some of which are summer resorts and others fishing villages or lumber towns, are Knappton, North Cove, Willapa, Tokeland, McGowan, Klipsen Beach, Holcomb, Frankfort, Chinook, Bay Center, and Lebam.

WAHKIAKUM COUNTY.

This county is in the southwestern part of the state and fronts on the Columbia river. Numerous islands in the river—which at this point is from a mile to seven miles wide—belong to the county, giving it upwards of 30 miles of shore line. It is the smallest mainland county of the state and contains but 267 square miles. It is intersected with several rivers, the valleys of which afford the farming area of the county. The interior is mountainous and rocky and heavily timbered, but along the shores of the Columbia, and Gray's river entrance to that river, much logging of timber has been accomplished, enabling the clearing of considerable of the bench and bottom lands.

Population: The 1910 census gives the county 3,285, an increase since 1900 of 466, or 16 per cent. 1,965 are native born and 1,095 foreign born, with Finlanders, Norwegians and Swedes predominating.

Land and Soil: The county contains a total of 170,880 acres, of which 29,030 acres were reported in 229 farms having 4,856 acres improved. This region is conceded to be ideal for dairying, which industry may be largely extended by clearing up the rich muck land bottoms, first bench lands and grazing lands in the already logged-off area. It is estimated that there are about 30,000 acres of such lands. Sheep and goat raising is a growing industry, yielding profitably of itself and assisting materially in the clearing of the thick underbrush. Two thousand acres of the county is reserved for military use. The uncut timber and mountainous area occupies about 75,000 acres, containing three billion feet of timber. The uplands are generally of a rich clay loam and sandy or gravelly loam adapted to orchards and farms, with some sandy beaver-dam land in the valleys, suitable for hay and forage.

Prices of Land: The prices asked per acre for unimproved bottom and brush land run from $25.00 to $50.00 and for second bench logged-off land from $5.00 to $20.00, while improved lands would cost the initial price plus what it costs to improve. The greatest cost in the improvement comes from clearing, which can be done with an expenditure of from $75.00 to $150.00 per acre.

Climate: The rainfall varies from 40 to 60 inches; that for 1912 being about 52 inches average for the county. The number of clear and partly clear days was about equal to the number of rainy and cloudy ones. In winter there is very little freezing weather, while the summer temperature seldom exceeds 80 degrees.

Resources and Industries: The chief industries, in their order, are lumbering, fishing, dairying, and farming. Several hundred men are always engaged in logging and there is still room for considerable extension of this industry. Five salmon canneries are busy during the fishing season and there are several creameries at advantageous points. This is preeminently a dairy country and the future development will undoubtedly be along this line. There is also much water power to be developed.

Water: The county is threaded with innumerable rivers and creeks, many of torrential force, capable of generating considerable horse power. No irrigation is necessary, but for domestic use pure water is everyhere abundant and easily obtainable.

Transportation: The principal movement of crops and manufactures is by freight traffic on the Columbia. Passenger boats also ply daily between the river towns and Astoria, while good graveled roads enter all of the river valleys for a considerable distance. A right of way is purchased for a branch of the Northern Pacific railway entirely through the county via the north bank of the Columbia, while a survey for a state road was ordered by the 1913 legislature.

Wages: The payroll of the logging, milling and fishing industries reaches large proportions and there is always a good demand for common and skilled labor at rather higher prices than elsewhere.

Social: The census bureau reports a population of 866 of school age with 533 in school attendance. Outside the county seat, the communities are so small as to limit the social life of the people to simple neighborhood hospitality. The county has 11 post offices and 21 school districts.

CITIES AND TOWNS.

Cathlamet: County seat. Incorporated. Population 1910, 352. Fronts on the Columbia river and is served principally by two lines of steamboats. The Northern Pacific railway has projected a branch line through the town.

its chief local industries are a large fish cannery, a saw mill, a creamery, and the large logging camps in the forests nearby. It has a waterworks system, two churches, a grade school, and a newspaper. Its chief social function is an annual regatta at the close of the fishing season.

Skamokawa: (Meaning smoky waters). A lumbering, dairying, and fishing town of between five and six hundred people, located in the south central part of the county at the entrance to the three valleys of the same name and overlooking the Columbia river. Good church and school facilities are enjoyed and one newspaper is supported.

Other towns and villages are Oneida, Eden, Grays River, Altoona, Brookfield, Rosburg, Waterford, and Deep River.

LEWIS COUNTY.

This important county occupying the central part of southwestern Washington, is 95 miles long and 26 miles wide and contains a total area of 2,369 square miles. It was the first county organized in the state, dating back to July, 1845.

Topography: Its topography is generally of a rolling and hilly nature. Much of the eastern part is taken up by the foot hills of Mount Rainier and the western part by the foot hills of the two coast ranges. Many beautiful and fertile valleys are formed by its several streams. Chief of these are the Cowlitz and its tributaries, draining the eastern portion into the Columbia river, and the Chehalis river draining the western portion into Grays Harbor. The Chehalis valley is from one to four miles in width and supports the largest cities of the county. Sixteen townships in the eastern and four in the central part are included in the Rainier National Forest Reserve.

Population: The census of 1910 gives the county 32,127. In 1900 there were 15,157, showing an increase of 112 per cent. 81.9 per cent were native born white, and 16.3 per cent were foreign born white. The remainder consisted of 499 orientals and 79 negroes. There were 9,630 of school age, with 6,264, or 65%, in attendance. Forty-six per cent of the county population lives in the incorporated towns.

Lands and Soils: The total area of the county is 1,516,160 acres, of which in 1910, 214,872 acres were in 2,261 farms, containing 62,838 acres of improved land, indicating an average sized farm to be 95 acres with 28 acres improved. Being interspersed with numerous rivers and large creeks, it affords many valley bottoms of level land with muck and sandy loam soils. Most of the plateau lands above these bottoms, while considerably undulating, are very fertile, the soil briny, usually of the shot clay and clay loam varieties. The national forest reserves containing 507,880 acres or approximately one-third of the county's area deprives it also of much of its agricultural land. Of private timber lands, there are approximately 500,000 acres holding nearly eighteen billion feet of merchantable timber, while the reserves have been estimated to contain an equal amount. The State holds 84,035 acres and 1,750 acres are open to homesteaders, leaving in the hands of private owners over 900,000 acres. There are nearly 200,000 acres of logged-off lands most of which are tillable. Some of this is alder bottom, containing rich vegetable loam, but the greater part is on the upland prairies with soil suitable for grains, grasses, forage and fruits. The remainder, although not tillable, will be ultimately valuable for stock raising.

Prices of Land: Good cut over, but otherwise wild, land can be bought almost anywhere for $10.00 per acre and up. Land clear of stump and level, or reasonably so, sells from $150.00 to $250.00 an acre. Near the larger cities, however, it commands higher prices. There are not so many offerings of the highly improved as there are of wild land. This latter is just as good—except for the pioneer work required on it. Some partly improved land can be leased on favorable terms.

Climate: Three zones of the rainy belt occur in this county; the northwestern corner receiving annually over 60 inches; all of the populated part over 40 inches and the reserve portion in the eastern part 60 to 90 inches. The total snowfall for the year at Centralia and Chehalis was 16 inches. The annual mean temperature was 51 degrees. The daily range seldom exceeds 25 degrees. The rains come gently and the little snow that falls dissolves almost immediately. Grass is green the year round.

Transportation: The county is traversed, and most of its principal towns are reached by, the Northern Pacific, Great Northern, Oregon-Washington Railroad & Navigation, Chicago, Milwaukee & St. Paul railways. The Columbia river and salt water is reached via the Cowlitz river from Toledo. Numerous logging and coal roads penetrate the forests and mining regions, and supply the tonnage for long hauls. Puget Sound is quickly reached at Olympia and Tacoma and the Pacific ocean at Willapa Harbor a few miles west. An electric railway connects Centralia with Chehalis, and is to be extended to the rural districts.

Markets: All surplus products of the county quickly reach a ready market. The large canneries of the county preserve the surplus fruit for future sale. Outside of the county, Tacoma, Seattle, Aberdeen, Hoquiam and Portland are the leading markets.

Social Conditions: The evidences of prosperity are everywhere. Modern and ornate architecture, well kept roads, public parks and expensive public buildings; the libraries and churches; plenty of grade and high schools, all indicate a high plane of civic pride and social refinement. A commendable feature, demonstrating the warm spirit of the county, is the annual entertainment known as the Evergreen Valley Festo, given by the city of Chehalis on July 4th to the agricultural communities. Between Centralia and Chehalis are the fair grounds for the Southwest Washington Fair. There are 49 post offices and 80 school districts.

Natural Resources: In addition to the vast timber resources, this county is known to be underlaid with lignite coal, and the presence of petroleum is apparent from seepages. Precious metals, too, are known to exist, but so far have been little prospected. It is from the land and its possibilities for dairying, stock raising, etc., that the wealth of the future will come. Present indications are that this will be increased by converting the falling water into power for manufacturing many exportable goods. In addition to the vast lumber mills which annually cut 300 million feet of lumber and shingles the county has seven producing coal mines and a large milk condensery. It contains one of the largest hop fields in the state, while potatoes and other root crops do exceptionally well.

CITIES AND TOWNS.

Chehalis: (County seat). Altitude 200 feet. Population 1910, 4,507; 1900, 1,775; increase, 154%. Local estimate, 5,600. In the fertile valley formed by the juncture of the Chehalis and Newaukum rivers. It is midway between Portland and Seattle and on the line of the Northern Pacific, Great Northern and Oregon-Washington Railroad & Navigation railways and is so linked by trolley with its neighboring city, Centralia, as to give both the title of "Twin Cities." It is a city of pretty homes and well provided with civic utilities. It has eight churches, a four year high school, two grade schools, two private schools, three banks, with combined deposits of nearly two millions, a public library, waterworks, a paid fire department, telephone and electric lights, two newspapers, paved streets, and cement walks. It derives much of its sustenance from the operations of several adjacent coal mines. It has a furniture factory, door factory, a large milk condensery, several wood working plants, turnings, moulding, etc., a number of lumber and shingle mills, a power plant, two machine shops, a powder works, a brick and tile plant, a bottling works, feed mills, a steam laundry, a creamery, a cigar factory, two marble works, etc., affording an annual payroll of over a half million dollars. Here is also maintained the state training school for boys and girls. Unimproved land within radius of two miles is worth about $100.00 per acre.

Centralia: Altitude 212 feet. Population 1910, 7,311; 1900, 1,600; increase, 357%. Local estimate, 10,000. The center of a rich dairy and farming section in the valley of the Chehalis and Skookumchuck rivers. The pace set in the construction of civic utilities has been the wonder of its short life. In its vicinity are operated several coal mines affording a large payroll. The city is the market place for vast quantities of the products of mines, farms, and ranges. In transportation facilities it is not excelled, 44 passenger trains leaving each day. Among its prominent industries are six saw mills, a sash and door factory, a glove factory, a porch column factory, besides a number of neighborhood industries. The city shares with Chehalis in the activities from the near-by coal mines and allied enterprises. City has large modern high school buildings, 14 churches, a public library, and other modern public buildings. There are

two daily papers, a semi-weekly and a weekly. It has electric lights and a paid fire department.

Winlock: Incorporated. Population 1910, 1,140; 1900, 655; increase, 74%. Located in the central part of the county on the line of three trunk railways, in the rich valley of the Olequa. Its main industries consist of a large lumber mill, brick and tile factory, and a creamery. Payroll is from $10,000.00 to $12,000.00 per month. Town supports a weekly paper, a high school, a grade school, six churches, electric lights, a good water system, cement sidewalks and volunteer fire department.

Pe Ell: Incorporated. Population 1910, 838. Local estimate, 1,000. Principal town on the Willapa Harbor branch of the Northern Pacific railway. It is a saw mill and farming town with much good land obtainable at low prices. Surrounding country is good for dairying. It has four churches, a high school and weekly newspaper.

Vader: (Formerly Little Falls). Population 1910, 631. Local estimate, 800. On the main line of the three principal railways close to the county line. It is the center of a large farming region of the Cowlitz valley. It has a lumber mill, a sash and door factory, and a tile factory. Considerable good clay is in vicinity. Good schools and churches are maintained; also a newspaper.

Mendota: Altitude 275 feet. Population (local estimate) 400. Served by the Centralia Eastern railroad. Coal mining is the main industry, 300,000 tons being shipped yearly. Annual payroll approximately $100,000.00. Town is owned by the mining company.

Napavine: Altitude 465 feet. Population (local estimate) 280. Served by the Northern Pacific, Oregon-Washington Railroad & Navigation, and Great Northern railways. The principal industries are lumbering and farming. There are four churches, a high school, and one grade school. Electric lights are being installed.

Morton: Altitude 997 feet. Population (local estimate) 400. Timber, agricultural and coal lands are near. It is served by the Chicago, Milwaukee & St. Paul railway. The principal industry is lumbering. Town has one church, a two year high school, water system, electric lights, a city park of ten acres, and a weekly newspaper.

Mineral: Altitude, 1,500 feet. Population (local estimate) 350. Surrounded by large body of timbered land which will develop into grazing country. Served by the Chicago, Milwaukee & St. Paul railway. Lumber and shingle manufacturing are the principal industries. Town has two churches, a high school, telephone and telegraph service.

Mossyrock: Altitude 415 feet. A good dairying section served by three automobile stages from Chehalis. Land is worth from $35.00 to $175.00 an acre. One church and good school facilities are provided.

Silver Creek: Altitude 700 feet. A dairying and general farming center. Improved lands are worth from $75.00 to $100.00 per acre.

Other important trading centers are Doty, Lewis, Ceres, Curtis, Riffe, Toledo, McCormick, Littell, Adna, Dryad, Kopiah, Vance and Mayfield.

COWLITZ COUNTY.

This county derives its name from the Cowlitz Indians, the original inhabitants of that locality. It lies in the southwest part of the state and is separated from the state of Oregon by the Columbia river. It is about midway in the valley between the Cascades on the east and the lower coast range on the west. The general slope is southwest toward the Columbia river into which it is drained chiefly through the Cowlitz and its tributaries. This latter is one of the largest rivers in the state and is navigable for a total distance of 50 miles. The Kalama river carries the drainage of the southeast. The eastern part of the county is occupied by the foot hills of Mt. St. Helens, while the remainder is composed mainly of rolling and valley agricultural lands. About 70% of the county is rolling, 20% level and 10% mountainous.

Population: According to the census of 1910 the population was 12,561. The subsequent growth has been rapid and the local estimate is now 15,000. Americans predominate, with Germans and Finlanders following.

Lands: The county has a total area of 737,920 acres, of which the Columbia Forest Reserve occupies 60,800

acres. The unreserved government lands, designated as "timbered and agricultural" amount to 5,700 acres and the state school and granted lands aggregate 75,190 acres. There are left in the hands of private owners nearly 600,000 acres. It is estimated that 80% of the land is tillable and the balance well suited to grazing. The level country referred to above is all bottom land.

Soil: The soil in the bottom lands is a sandy loam and the hill soil is a black loam and shot clay. Fruits, berries, vegetables and grain grow readily and reach a high degree of perfection.

Prices of Land: There is a great deal of land, both unimproved and improved, that may be purchased, the unimproved would cost $10.00 and up per acre, with estimated cost for putting under cultivation, $60.00 and up. Land thoroughly improved means cleared and under the plow. Twenty acres of the best land is considered sufficient for an ordinary family.

Resources and Industries: There are still nearly 300,000 acres of thickly growing timber in the county. This and the rich farm lands constitute the main resources. Lumbering is the principal industry, with dairying and fishing gradually increasing in importance. Fishing is chiefly for smelt and there are millions of these little fish caught in the Cowlitz river every year. Horticulture is also profitable. Fruit, grain, berries and vegetables of all kinds constitute the main crops.

Transportation and Markets: The Oregon-Washington, the Northern Pacific and the Great Northern railroads and the Pacific highway, a primary state road, traverse the county from north to south. The Columbia flows along the southwestern border and the Lewis river is navigable for a distance of 45 miles. Daily steamboats connect all river points with Portland and Astoria. County roads are numerous and kept in first class condition. The principal markets are Portland, Seattle and Tacoma, where everything produced can be readily disposed of at fair prices.

Wages: The recognized wages paid throughout the county for milking and general farm work are $35.00 per month with board and $2.50 per day without board. In logging camps, saw mills and other lines of endeavor the prevailing wages, not including board are, for unskilled, $2.50 per day, for skilled, $4.00 to $8.00 per day.

Social Conditions: The social conditions in this county are good. Churches of many denominations, district, grade and high schools are to be found in all of the settled communities, which are also served with telegraph and telephone and satisfactory mail delivery. There are altogether 20 postoffices, 64 school districts and 8 high schools.

CITIES, TOWNS AND VILLAGES.

The municipal corporations and village settlements are: Olequa, Castlerock, Tillikum, Kelso, Metcalf, Carrolton, Kalama, Hermione, Martins Bluffs and Woodland, along the railway lines. Oak Point, Stella, Eufaula and Catlin are off the railroads, but contiguous to water transportation and easily reached by good roads, while Ariel and Cougar are on the north fork of the Lewis river. Other centers are Ostrander and Lexington.

Castlerock: Population 1910 (census report), 998. Local estimate, 1,100. Situated on the Cowlitz river and on the main line of the three transcontinental railways that traverse the county. It is called the gateway to Mount St. Helens and Silver and Spirit lakes. The sustaining industries are lumbering and farming. Shingle manufacturing runs to about 150,000 per day. A box factory is being constructed and a creamery of large capacity is running. A vast area of standing timber is directly tributary and the logged-off lands are fast becoming of great agricultural importance. Four churches, an $18,000.00 school building, public library and two newspapers contribute to the spiritual and mental welfare. It also has electric lights, a volunteer fire department and two telephone systems.

Kalama: County seat. Population 1910, 816. Local estimate, 1,200. It is situated near the head of deep water navigation on the Columbia river and the Northern Pacific, Oregon-Washington Railroad & Navigation Co. and Great Northern railways. Steamers run to Portland and connections are made with Astoria. It has a cold storage, ice plant, shingle mill and two large saw mills. Two state fish hatcheries are also here. Four churches, a four year high school, telegraph and telephone service, and two newspapers are maintained. City has electric lights, good water supply, and volunteer fire department.

Kelso: Altitude 30 feet. Population (U. S. census) 2,039; mostly American.

Five thousand acres of garden land lie in the immediate vicinity, while a little more remote is an immense body of magnificent timber. This city has the world-wide distinction of having originated the famous ocean-going, cigar shaped, log raft. Four saw mills and two shingle plants are located here. Fruit growing, dairying and general farming are carried on with marked success. Over 2,000,000 pounds of smelt are shipped annually. There are six churches, a high school and four grade schools, telephone, a city park, newspaper, electric lights, and good water system. Railroads are Great Northern, Northern Pacific and Oregon-Washington Railroad & Navigation. Steamers run to Portland and connections are made by ferry to Astoria.

Woodland: Population 384 (U. S. census). Local estimate, 600. Situated in the southwestern part of the county on the Lewis river and on three transcontinental lines, with steamboat transportation to Astoria. It is surrounded by a good farming and dairying country. The principal industries consist of several saw mills, seven logging camps, a shingle mill, a creamery and cheese factory. It has city water works, electric lights, volunteer fire department, two churches, a combined grade and high school, two telephone lines and a newspaper. The Lewis River Valley Fair is held here in the fall.

Ariel: Altitude 800 feet. A lumber town located on the north fork of the Lewis river. Population is estimated to be 500. Transportation is by steamer.

CLARKE COUNTY.

This county, named for the great explorer, is one of the oldest and most highly improved communities in the entire state. It is bounded on the west and south side by the Columbia river, while the north fork of the Lewis winds along its northern edge, the southern fork draining the center of the county. Other important rivers are the Salmon and Washougal emptying into the Columbia. All these, with many tributary creeks give the county especially good drainage and produce a horse power which has never been estimated, but which will prove to be very great. Only a small part in the northeastern corner is mountainous and the remainder consists chiefly of gently rolling territory. There are also smaller portions of bottom land.

Population: 1910 census gives 26,115; 1900, 13,419; almost 95% increase. Growth for past three years has been even greater proportionally. Citizenship is largely American, with Scandinavian and Germans following in order.

Lands: The total area is about 405,760 acres, out of which the state holds about 2,700 and the United States 1,600. At Vancouver there is also a government military post known as Vancouver Barracks, containing about 600 acres and with 1,465 men. About 75% of the total area of the county is tillable, but not more than one-fifth of this tillable land has been improved. The untillable would be suitable for grazing and the development of water power. Upwards of 200,000 acres has been logged-off or burnt over.

Soil: Excepting the bottom lands, soil is of a clayey or gravelly nature. The gravelly lands are best adapted for small fruits, berries, etc., bottom lands for hay and gardening, while the clay soil is very deep and good for all kinds of farming. No irrigation is needed and the climate is well suited for fruit raising. Along the Columbia and Lewis rivers is a deep sandy loam admirably suited for and adapted to stock raising and dairying.

Prices of Land: Unimproved land may be had in large quantities at prices varying from $15.00 to $150.00 an acre with the cost for putting it under cultivation ranging from $75.00 to $150.00 per acre. Improved land, i. e., land cleared, fenced and ready for the plow, may be had for $50.00 to $500.00 an acre. It is estimated that from 10 to 40 acres will be sufficient for an ordinary family of five persons. Some may be leased at terms satisfactory to the tenant.

Resources and Industries: Besides the agricultural lands and water power as noted above there are about 30,000 acres of timber lands and some undeveloped coal fields. Opportunities exist for Columbia river fishing. The principal industries are lumbering, dairying, diversified farming, and fruit growing. This county has more plum and prune trees than all the rest of the state combined, there being 612,-

187 trees January 1st, 1913. In dairying it is one of the five leading counties. This is an excellent county for those desiring small homes, and the country facing the Columbia river on the south is unusually picturesque and attractive. About 400 acres in the county are devoted to the raising of English walnuts, for which the deep soil is well adapted.

Transportation and Markets: The Northern Pacific, Great Northern, Oregon-Washington, and the Spokane, Portland & Seattle railroads all traverse the county, while the Southern Pacific trains run over the Oregon-Washington Railroad & Navigation company's tracks, and the navigable Columbia river on the south and west furnishes daily water transportation to all river points. The Pacific Highway and state road No. 8 cross the county from north to south and from west to east respectively, while good county roads are being constantly improved and extended. With the cities of Vancouver in the county, Portland just across the river, and Tacoma and Seattle reached in five or six hours, no trouble is experienced in disposing of practically all products.

Wages: Wages paid for farm labor, including board, are $40.00 a month; without board, from $2.00 to $2.50 per day. Work may also be found in the logging camps, paper mills, rock quarries, brick and tile factories, building, railroading, etc. Wages for unskilled amount to $2.00 per day, while for skilled labor from $3.00 to $7.00 per day is the prevailing wage.

Social Conditions: Being an old established community, Clarke county is blessed with all the social conveniences and comforts that can be expected anywhere. Good public schools, both grade and high are found in all localities. Churches of all denominations are maintained, while telegraph and telephone wires reach nearly every settled portion. Agricultural fairs are held in several of the larger communities each year for the display of local products. There are 18 post offices and 83 school districts.

CITIES AND TOWNS.

Vancouver: County seat. Altitude 73 feet. Population 1910 census, 9,300. Local estimate, 12,000. This is the oldest town in the state, having been settled by the Hudson Bay Company in 1826. It is backed by all the agricultural and timber resources of Clarke county, while many manufacturing industries are carried on within the city itself. Chief plants are three saw mills, three planing mills, a box factory, tile plant, two iron foundaries, two brick yards, an ice and cold storage plant, flour mill, two prune packing plants, a brewery and bottling works, a granite and marble works, and a number of minor establishments. Being a railroad terminal about 400 men are employed in the car shops. In addition there are 1,460 men at the garrison with a monthly pay roll of about $40,000.00. City has about 12 miles of paved streets, electric street cars, a paid fire department and both gas and electric lights; 11 churches, a high school, six grade buildings, and one private academy; also a public library, one daily and one weekly paper and a five acre city park. The state schools for the deaf and for the blind are here. City street and sewer improvements for 1913 cost $140,000.00. For transportation facilities read county paragraph on that subject. An electric line gives half hour service to Portland. A ferry is used at present for crossing the Columbia river to Portland, but work is soon to begin on a $1,600,000.00 bridge. A county fair is held here each September.

Camas: Altitude approximately 58 feet. Population (census 1910) 1,125; local estimate 2,000. Outlying districts are highly adapted to general farming, dairying and fruit raising. It has a paper mill whose monthly payroll for 800 men averages $40,000.00, a saw mill, creamery and stone quarries. Fishing, lumbering and general farming are important. Plenty of electric power is available. Estimated yearly payroll for vicinity is $960,000.00. Plenty of work may be found at $2.00 a day for unskilled up to $8.00 a day for skilled labor. A paper box factory employs women and girls at $1.25 per day. There are also six churches, a high school and weekly newspaper.

Washougal: Altitude nearly tide level. Population (census 1910) 456; local estimate, 500. It has connections with all transcontinental lines via the Spokane, Portland & Seattle railroad. Several lines of steamboats plying the Columbia also make daily stops here. Thousands of acres of fertile lands are tributary. General farming, dairying and prune culture are carried on extensively and profitably. It has one woolen mill, two machine shops, and a boat building and boat storage yard.

There are five churches, a high school and a weekly paper.

Yacolt: Altitude 727 feet. Population (census 1910) 435; local estimate, 585. The terminus of the Yacolt branch of the Northern Pacific railroad and located on a small prairie in close proximity to the foot hills. Surrounding land, adaptable to fruit and vegetables, is worth from $25.00 to $125.00 per acre. The Twin Falls Lumber Company operates a large plant here. Opportunities for work in mills and at logging camps are plentiful. The town has a high school, three churches, and one newspaper.

Battle Ground: Altitude 290 feet. A village located on the Yacolt branch of the Northern Pacific railway, and surrounded by dairy and fruit lands. It has four saw mills, and a brick and tile factory.

Ridgefield: Altitude 80 feet. Estimated population, 500. An important and growing farming center located on the main line of four transcontinental railroads. It has a saw mill and shingle mill, five churches, a high school and newspaper. A horse and cattle show is held in June.

La Center: Altitude 80 feet. Estimated population, 400. Located on the east fork of the Lewis river at the head of navigation in the heart of a beautiful farming locality 25 miles from Portland. Close by is a fruit cannery and 12 saw mills. Church and school facilities are adequate.

Orchards: Altitude 200 feet. A pretty town located in the midst of a fruit section devoted to the raising of prunes, apples, cherries, pears and berries. Its people maintain a church and high school. An electric line connects with Vancouver.

Other important centers are Etna, Amboy, Brush Prairie and Heisson.

SKAMANIA COUNTY.

This county is situated in the heart of the Cascade Mountains. It slopes from the snow covered summits of Mt. St. Helens and Mt. Adams southward to the Columbia river, which bounds it for 40 miles on the south. Springs from pure snow fields lengthen into numerous streams that intersect the plateau heights and flow through an immense forest area to join the fabled "Oregon." Before completing their courses, however, they have formed river valleys rich with the decaying debris carried by their waters. In these valleys are to be found most of the people of the county, for all the land held in private ownership is within the nine townships bordering on the Columbia river.

Population: The census of 1910 gives the county 2,887, that of 1900, 1,699, showing an increase for the decade of 71%. A steady growth is continuing. 77% are native born. Of the foreign born, Norwegians, Turks, Germans, Swedes and Canadians are in the lead. The recent building of the Spokane, Portland & Seattle railway has had much influence upon the growth of this section.

Lands: Of the entire area of 1,078,400 acres, the government has taken 868,560 acres into the Columbia and Rainier National Timber Reserve; 36,940 acres are owned by the state and 5,500 acres were unreserved and unappropriated government lands July 1, 1913. In 1910, 25,631 acres were in 232 farm ownerships containing 4,477 acres of improved area. Much of the reserve, however, contains choice agricultural land, which can be acquired under rigid restrictions. Of the open land a large area, estimated at 40,000 acres, has been logged-off, revealing valuable rolling uplands admirably drained and suitable for most agricultural purposes, especially fruit raising. Much of this was formerly held by large timber companies, but of late it has been subdivided and is now offered for sale to the newcomers.

Prices of Land: Although this county is considered within the favored fruit land area of the state, it is somewhat newer in settlement and prices have not reached the maximum of other counties. A very limited area nearest the river landings or railway stations is most valuable. Wild or unimproved land, which is for the most part logged-off, sells at from $5.00 to $150.00 per acre, and will cost from $50.00 to $150.00 to prepare for cultivation, but it is always worth the full cost of development and more, since its annual earning capacity is from $50.00 to $100.00 per acre. Land under cultivation set to fruit, with good buildings, brings much higher prices. There are some chances for leasing on favorable terms.

Soil and Climate: Several varieties of soil are here, "shading from the

volcanic ash of the White Salmon and Little Salmon valleys, to the light and heavy loams and clay subsoils predominating in the central and western sections of the county, and the red shot and mixed soils on all the higher levels." In the eastern part fruit growing has proved especially suitable. In the valleys is also found a black loam, deep and strong and most desired for vegetable growth. The annual precipitation is unusually large in most parts and nearly everywhere sufficient to preclude necessity of irrigation, although in a few places its practice for a short time during the dry season helps to produce even better results. There are numerous health resorts with mineral waters containing curative properties.

Resources: The reserve being open for mineral entry, considerable prospecting is being done and many good paying mines of copper and lead have been opened, but are awaiting better transportation facilities. The chief resources at present consist of the many billion feet of uncut timber, the fruitful lands released from the cutting of it, and the untold quantities of salmon in the Columbia river. Fruit and berry growing, dairying and poultry raising, as well as lumbering and fishing are all important industries contributing to the wealth of this comparatively new section.

Transportation and Markets. The facilities for moving crops and for travel are ideal. Every waterfront town has its landing at which stop four times a day boats plying between Portland and The Dalles. The Spokane, Portland & Seattle railway hugs the river bank across the county and provides every station with four trains each day. The wagon roads are reasonably good, and where they reach through the forests to the interior resorts are wonderfully picturesque. These facilities provide good access to the local markets of Portland, The Dalles, Seattle and Tacoma.

Social: Health resorts at the river towns and at Spirit Lake and elsewhere attract many outside people who with those permanently engaged in horticultural pursuits form a happy nucleus for much social enjoyment. Good schools and churches are provided and a county fair is annually held at Stevenson. There are 28 school districts, 12 post offices and 8 high schools.

CITIES AND TOWNS.

Stevenson: County seat. Population 1910, 337. Present local estimate, 400. It is the only incorporated town in the county and the metropolis of the district. It is picturesquely located in the heart of the Cascades on the Columbia river and the Spokane, Portland & Seattle railroad. It has several saw mills and planing mills; also a water works system, good streets, electric lights and public buildings, including a high school, a grade school, two churches and several hotels—one a health resort of medicinal waters—a bank, a newspaper, steam laundry, etc.

Carson: Estimated population, 250. A beautiful river town on the Spokane, Portland & Seattle railroad in the Carson valley, opposite Hood River. The town and valley is famous for its pleasant climate and well equipped health resorts. Lumber is the chief industry, with gardening, fruit raising and stock raising following. It has one church and a good school.

Underwood: Is an attractive home town overlooking the Columbia river and the Hood River valley. Fruit growing is the chief industry. It has good church facilities and a four year high school.

Other towns and trading centers are Mt. Pleasant, Butler, Cape Horn, Cooks, Lange and Chenowith.

YAKIMA AND WENATCHEE VALLEYS.

KLICKITAT COUNTY.

Klickitat county consists of a long rather narrow strip of country lying in the south central part of the state between the southern boundary of Yakima county and the Columbia river which separates it from the state of Oregon.

Topography: It extends westward into the edge of the Cascade range and partakes here of their magnificent scenery, while eastward it stretches out over the foot-hills and rolling plains to Benton county, and the brown sage brush hills of the fam-

ous "Horse Heaven." Altitude varies considerably, the highest parts being in the Cascade foot hills on the west, the Columbia mountains on the south in ranges 14, 15, 16 and 17, and the Simcoe mountains on the north where an elevation of 5,000 feet is reached. The lowest places are near the Columbia river. Many agricultural plateaus and valleys are found, chief of which are the White Salmon valley in the west and the valley of the Klickitat near the center of the county. This latter is approximately 30 miles long by 8 miles wide, in ranges 14, 15, 16 and 17, and represents the fertile country around Goldendale. 50% of the county is rolling, 20% level and the remainder mountainous.

Population: U. S. census for 1910 gives 10,180. In 1900 there were 6,407. There are many Germans, Scandinavians, Swiss, Danes and English in addition to the American born. Growth of past three years is probably normal.

Lands: The total area of the county comprises 1,168,000 acres, of which 32,000 are in the Columbia Forest Reserve, and 65,280 are in the Yakima Indian reservation, 44,284 are unappropriated timber, agricultural and grazing lands open to homesteaders and 64,122 acres are state lands. The balance of over 900,000 acres are in private ownership. About one-half of this is in farms, but only about one-fifth is improved, although approximately 400,000 acres of the county is tillable, and the remainder is suitable for grazing.

Soil and Climate: The soil varies from the alluvial along the rivers and creek bottoms to red loam and volcanic ash soil on the foot hills and higher plains. Volcanic ash soil prevails in the eastern two-thirds, there being some clay loam or black loam in the central part, with red clay subsoil. Rainfall runs from 10 to 12 inches in the extreme east to as high as 30 or 35 inches in the White Salmon valley. Dry farming is usually practiced, the moisture being sufficient to produce excellent crops.

Prices of Land: Unimproved land, with considerable on the market but with no panicky desire to sell, can be had at prices ranging from $15.00 to $100.00 per acre, although the higher price is unusual for most parts of the county. Improved grain land usually runs from $15.00 to $75.00 per acre, while orchard lands sometimes run up into the hundreds. The highest priced fruit lands are around White Salmon, where fruit growing is carried on with success equal to the Hood River country. Clearing of rough lands will cost between $15.00 and $75.00 an acre, the thicker timbered portions requiring the larger outlay. Some land may be leased on shares for one-third the crop. Around Goldendale from 20 to 80 acres of land is sufficient for a family. In the eastern part from 160 to 320 acres would be needed. In the White Salmon valley 10 acres will sometimes suffice.

Resources and Industries: Agricultural and horticultural pursuits form the main industries. Some salmon are fished from the Columbia river and some timber is cut on the northern and western slopes. This latter resource, however, is very little developed and the stumpage is usually quite light. Pine and fir predominate. The main crops are wheat, alfalfa, and fruit. Considerable live stock is still raised, including a great many sheep. About a million bushels of wheat are raised annually, also some oats, rye and barley. Commercial apple growing is comparatively a new industry, but its success has been demonstrated in the White Salmon valley west of the Klickitat river, along the Columbia river, and on the sunny slopes of the Simcoe foot hills. Other fruit and vegetables do well. Dairying is destined to become important. A stone quarry exists near Wright on the branch line of the Spokane, Portland & Seattle railroad.

Water: Plenty of pure water for domestic purposes may be found in springs, creeks and wells. Depth of wells varies in different localities. Much water power exists in the Big Klickitat and probably about 60,000 H. P. can be developed. From this river it is proposed to get the water for irrigating the "Horse Heaven" country. Very little irrigation is practiced at present.

Transportation: The Columbia river is navigable all along the southern border of the county and daily steamboat service is enjoyed by all points on the river between the Pacific ocean and the head of navigation. The Spokane, Portland & Seattle railroad, having transcontinental connections, parallels the river on the Klickitat county side and the Oregon-Washington railway runs along the Oregon side directly opposite. A branch line of the Spokane, Portland & Seattle

extends to Goldendale. State road No. 8, a secondary highway, runs through the entire county and on to Mabton in Yakima county. The county roads are especially good and reach every trading point within the county. In many places automobiles are run the entire year.

Markets: A ready market with fair prices is always obtainable. The wheat is sold in warehouse and shipped either to the east or via Seattle and Tacoma to European and other foreign markets. The fruit is sold almost entirely in the east. The hay, lumber, dairy products, etc., are at present usually needed for local consumption.

Wages. Farm labor, including board, receives from $1.00 to $1.50 per day or $25.00 to $40.00 per month. Without board wages run from $2.50 to $3.00 per day. Plenty of work at general framing, land clearing, etc., may be obtained during almost the entire year. It slacks up some during December, January and February. Other work may be had in the lumbering industry or in road building and repairing. Highly skilled labor demands in some lines as high as $6.00 per day.

Social Conditions: Churches, schools, telegraph and telephone lines, rural free delivery of mail, etc., serve almost every resident of the county. In the larger centers are to be found the accredited high schools, libraries, theaters and fraternal organizations. There are 85 school districts and 10 high schools.

CITIES, TOWNS AND VILLAGES.

According to the latest report of the post office department there are thirty-two post offices in Klickitat county. Many of these settlements are stations along the north bank of the Columbia river on the Spokane, Portland & Seattle railway. The following are the chief ones:

Goldendale: County seat. Altitude 1,650 feet. Population 1910, 1,203. Local estimate 1,500. Located on the Little Klickitat river and is the terminus of the Goldendale branch of the Spokane, Portland & Seattle railway. Daily stages connect with Maryhill, 10 miles to the south on the line of the Spokane, Portland & Seattle railroad and the Columbia river. Just north is one of the largest yellow pine timber belts in the state. City is the center of the Klickitat valley where general farming is practiced and nearly every crop common to the temperate zone is possible. Very picturesque is the surrounding country, showing three of the most notable mountains in the west, viz., Mt. Hood, Mt. Adams, and Mt. St. Helens. Rainfall is about 20 inches annually, while the thermometer seldom drops to zero. City has two planing mills, two flour mills, meat packing plant, ice plant, two machine shops, brick yard and creamery. Six or eight saw mills in the vicinity have a capacity of from 15,000 to 40,000 feet per day. There are six church denominations, a high school, two grade schools, public library, and three newspapers, also city park, gravity water, electric lights and telephone.

White Salmon: Altitude 200 to 1,800 feet. Population 1910, 682. Local estimate 800. A growing town located on the Spokane, Portland & Seattle railroad and the Columbia river at the mouth of the White Salmon river. Fruit has been found particularly adaptable for this valley, the soil, climate, etc., being like the Hood River country just across the Columbia. Undeveloped land costs from $50.00 to $350.00 per acre. Much timber and water power are available. City has two banks, four churches, a weekly newspaper, high school, and one private school. Rainfall is about 35 inches. No irrigation is practiced.

Bickleton: Altitude 3,015 feet. Estimated population 200. Some Danes besides Americans. A farming center in the northeastern part of the county in a mountainous or hilly country. Wheat and stock raising is carried on extensively. The only transportation is by good wagon roads to Mabton and Roosevelt. Lands in the vicinity cost from $20.00 to $30.00 an acre. Town has two churches, one grade and one high school and a weekly newspaper.

Lyle: Altitude 150 feet. Estimated population 175. An agricultural center near the Columbia river and at the junction of the Spokane, Portland & Seattle railway and its branch to Goldendale. Grain, hay, sheep and cattle are produced in considerable quantities, while many fruit trees have been recently planted. It has a church, high school, and newspaper, also telephone connections.

Guler: Altitude 1,940 feet. A lumbering, dairying and stock raising

center located on the Klickitat river in the northwestern part of the county. Fruit, grain and vegetables also do well.

Cliffs: One of the Spokane, Portland & Seattle railroad division points and a trading center for a considerable territory. A good nut producing country is near by.

Other important towns and trading centers are Roosevelt, Laurel, Wrights, Centerville, Glenwood, Bristol, Columbus, Klickitat, Fallbridge, Lucas and Bingen.

BENTON COUNTY.

Benton county was organized in 1905 out of the eastern portions of Yakima and Klickitat counties which form its western boundary. It includes the lower part of the Yakima valley, which at present supports the larger part of the population.

Topography: In the north central part are low ranges of hills known as the Rattlesnake mountains, while the southern portion is occupied by the famous "Horse Heaven" plateau. The Columbia river bounds it on three sides and supplies water for a number of pumping propositions. The surface is generally rolling and covered with bunch grass. About 60 per cent. is of plateau formation.

Population: 1910 census 7,937. Local estimates indicate considerable increase during the past three years. Foreign element consists chiefly of Canadians, English, Germans and Scandinavians.

Lands: The total land area is 1,069,440 acres out of which there are 97,761 acres of unappropriated and unreserved government lands, part of which is described as irrigated, arid and mountainous, and part as grazing, some timber, prairie and farming. The state school and granted lands (September 30, 1912), amounted to 74,886 acres. The remainder of the land area would be in the hands of private owners. Approximately 500,000 acres altogether, are tillable, while that considered non-tillable is suitable for grazing.

Dry farming is practiced in the uplands and irrigation is found advantageous in the valleys. The unimproved portions are mostly covered with sagebrush or bunch grass. Nearly half of the county could be placed under cultivation and with sufficient water would yield well. Where irrigation is not at present practiced, dry farming methods are resorted to.

Soil and Climate: The soil is all volcanic ash with some sand mixed. In many places it is of unusual depth. Annual precipitation is about 8 inches. The mean winter temperature is about 45° and the mean summer temperature about 70°.

Prices of Land: Unimproved irrigable land can be purchased for $10.00 an acre. Raw land irrigable from present projects costs from $100.00 to $200.00. The cost for putting under cultivation varies. Usually about $25.00 an acre would be sufficient for clearing and leveling. Improved land, uplands not irrigable, may be had for from $15.00 to $25.00 an acre. Irrigated alfalfa lands run from $150.00 to $250.00. Orchards in bearing will bring as high as $500.00 an acre. From ten to twenty acres of irrigated land is sufficient for a family. Many apportunities for leasing are open.

Resources and Industries: Industries are strictly along the lines of agricultural, horticultural, and stock raising pursuits. Many cattle come from other parts to pasture in the warm valleys during the winter. The strawberries of Kennewick are the earliest on the market, preceding the famous Hood River berry by from two to four weeks. Apples, pears, peaches, apricots, berries of all kinds, alfalfa, timothy and clover are easily produced in large quantities on the irrigated lands, while the uplands are devoted chiefly to wheat raising.

Water: An abundant supply for irrigation is obtained from the Yakima and Columbia rivers, their numerous tributary branches and from wells. A water right under the Sunnyside ditch costs $52 per acre. The supply for domestic uses is secured from the Columbia river and wells. In the hills farmers must depend on wells alone.

Water Power: Abundance of water power exists, about 6,000 horse-power in the Yakima river and 300,000 in the Columbia at Priest Rapids, just over the northwest corner of the county.

Transportation and Markets: Four great railway systems with transcontinental outlets traverse the county, viz.: the Chicago, Milwaukee & St. Paul, along the northern border, the Northern Pacific and Oregon & Wash-

ington through the central portion, and the Spokane, Portland & Seattle along the north bank of the Columbia river the entire width of the county. The Columbia river is navigable for about 140 miles and regular steamboat service exists between certain points. The "Inland Empire" highway, a state constructed primary road, crosses from west to east, through the center of the county, while county roads extending to every settled portion of the county, are usually in good condition.

The markets for products consist of Puget Sound cities, Alaska, the Orient, Spokane, Butte, Helena, British Columbia and even New York City.

Wages: Plenty of work can be found during the seasons of seed time and harvest. In the wheat districts many men are employed in harvesting the crop. In the fruit districts, picking and packing furnishes labor for a small army of industrious people. The wages paid for this kind of labor amount to $30.00 a month and board. Without board $2.00 to $2.50 a day is the regular scale.

Social Conditions: Churches, libraries, schools and fraternities are found in the cities of this county. Good telegraph, telephone and mail service are also usually enjoyed. Rural free delivery extends to the further parts.

There are 21 post offices, 35 school districts and 7 high schools.

CITIES, TOWNS AND VILLAGES.

Many small cities are located on the four railroad lines or near the Columbia and Yakima rivers. Most of these are centers for securing supplies or shipping products. Their location can be seen from the map contained herein. The more important municipalities are as follows:

Prosser: County seat. Altitude 666 feet. Population 1910, 1,298. Located on the Northern Pacific and Oregon-Washington Railroad & Navigation railroads, in the western part of the county on the Yakima river. Many acres of irrigated lands are tributary. The Northern Pacific orchard, one of the largest in the country, is located near. It has an ice plant, flour mill, power plant, creamery, electric lights, city water, new high school, several grade schools, seven churches, two banks, and two newspapers. Approximately 2,000 H. P. is being utilized from the Yakima river.

Kennewick: Altitude 300 feet. Population 1910 census, 1,219. Local estimate 2,000. Located on south side of the Columbia river near mouth of Snake river. It is served by the Great Northern; Spokane, Portland & Seattle and Oregon-Washington Railroad & Navigation railroads, also by river transportation on the Columbia and Snake rivers. It has a flour mill, Pacific Power and Light plant, box factory, broom factory, cold storage and bottling works, grape juice factory, sheet metal works, and planing mill; also seven churches, a high school, two grade schools, one private school, public library, telephone, and two newspapers. The Columbia river valley grape carnival is held here.

White Bluffs: Altitude 400 feet. Estimated population 500. The center of an irrigated section on the Columbia river. Peaches and grapes and alfalfa do especially well. The surrounding country is excellent for fruit, dairying and stock raising. On the highlands back, wheat is raised. It has electric lights and good water supply, high and grade school building, one bank, two churches, and one weekly newspaper. Transportation is by Chicago, Milwaukee & St. Paul railroad, stage and Columbia river boats down to Kennewick and Pasco.

Richland: Altitude 309. Estimated population 300. Lies just above the mouth of the Yakima river on the west bank of the Columbia river. Fruit, alfalfa, dairying and chicken raising, are profitable industries. Land is watered from a gravity ditch out of the Yakima river. There are three churches, a high school and two grade schools, city park and newspaper. Transportation is by automobile.

Kiona: A new town on the Northern Pacific and Oregon-Washington Railroad & Navigation railroads near the bend of the Yakima river. Four miles away are wheat fields. Irrigation is expected in the near future.

Other important trading centers are Carley, Paterson, Badger and Mottinger.

YAKIMA COUNTY.

This is the second county in size in the state, its total area being 5,059 square miles. It takes its name from the Yakima river which with its tributaries drains the county and supplies the water with which this wonderful valley is irrigated.

Topography: The western part lies

on the eastern slope of the Cascade mountains. The timbered spurs and foot hills of these occupy a large part of the county. Lower hills covered with sage brush approach from the east, south and north, almost encircling the thousands of acres of rich agricultural land on either side of the Yakima river. Hills from the east and west almost meet at a point about 10 miles south of North Yakima called the Union Gap, leaving just enough space for the Yakima river, the public highway and the railroads, thus dividing the county into two natural divisions. The portion above this gap with North Yakima as its center has experienced the largest amount of development. A number of smaller valleys, equal in fertility, are tributary to this. Chief of these are the Naches, Atanum, Cowiche and Wenas.

Below the gap is the larger area of level land which extends for forty miles east and west and many miles north and south. Through this part flows the Toppenish and Satus rivers, divided by the Simcoe Hills. Here is also the Sunnyside project, the largest in the state and capable of irrigating 100,000 acres of land.

The elevation of the county varies from 12,307 feet, at the summit of Mt. Adams on the southwest boundary line, to 1,067 feet at North Yakima and 735 feet at Sunnyside.

Population: The census of 1910 gives the county 41,709, that of 1900 13,462, showing the remarkable increase of 209 per cent for the decade. This large increase was due to the recent building of big irrigation ditches which made possible the successful cultivation of many acres of fertile land. 5,073 were foreign born whites, including Canadians, Germans, English and Scandinavians.

Lands: The county contains a total area of 3,237,760 acres, of which 554,360 are in national forest reserves, 1,058,840 in the Yakima Indian reservation, 74,000 acres surveyed and 274,500 acres of unsurveyed government lands unappropriated and unreserved. In addition the state holds 129,419 acres. Of the remainder in private ownership, 320,921 acres were in farms of which 176,410 acres were improved. There are a great many acres under completed projects that offer good inducements to those desiring land while several projects are contemplated that will irrigate thousands of acres more. There is also much land above any possible plan for irrigation which can be utilized for dry-farming and stock raising.

Below the gap, besides the private, state and federal lands, one may purchase pieces of the Yakima Indian reservation which are often placed on the market and sold at auction to the highest bidder. This section offers particular advantages to those desiring to engage in dairying, stock-raising, or general farming. The Wapato project is expected to irrigate 80,000 acres more of this in the near future. On the east side of the Yakima river, below the gap, is the Sunnyside ditch, mentioned above.

Soil: The soil of the county in common with several others of eastern Washington is described as mostly of volcanic ash loam, rich in the elements necessary to vigorous plant life. Aided by irrigation it is well adapted to nearly all kinds of vegetation which grow with wonderful strength and rapidity. It varies in depth in the valley regions from ten to sixty feet. It is a soil easy to till and ideal for irrigation, in that it holds moisture from evaporation to a remarkable degree.

Prices of Land: Prices for raw irrigable land range from $50.00 to $250.00 an acre, not including water rights; with water the prices run from $100.00 to $300.00. Above the canals, land, with soil just as good, can be had for $25.00 to $50.00. Bearing orchard lands range from $400.00 to $1,200.00 per acre and often include comfortable homes. Hay lands run from $125.00 to $300.00 per acre. Hop lands will fetch about $400.00 an acre. It should be noted that the highest priced land is closer to the cities. Equally good land further away is purchasable at comparatively low prices. For intense cultivation of garden crops or for orchards and small fruits ten acres will suffice an ordinary family. For alfalfa, dairying, stock, etc., 40 acres will make a nice farm. The ground is easily prepared for cultivation and original perpetual water rights cost $52.00 per acre under the Sunnyside and $93.00 under the Tieton. There is a small annual charge for maintenance, 95c per acre under the Sunnyside and $1.50 under the Tieton. The private projects vary in cost.

Climate: The county lies in three different zones of precipitation. The annual rainfall of the western edge from the summit of the Cascades to the base of the timbered area is greater than elsewhere, and much of this is snow. From here to the center of the

county, it gradually diminishes, while the eastern half of the county is in the dry zone. North Yakima, central in the county, but in the arid zone, recorded for 1912, 7.22 inches of rain, the greatest being in January, 1.82 inches, and November 1.04. Each of the other months had some rain, the least being in September with 0.17 inches. The annual mean temperature was 50.8 degrees above. There were 62 rainy days, 177 clear, 92 partly cloudy and 97 cloudy. Summers are long and uniform and the winters are always short. Violent storms, tornadoes or cyclones are unknown.

Natural Resources: While precious minerals are known to exist in the Cascades, there seems to have been little prospecting done and no development work. Preeminently the county's chief resources are in its wonderful soil and befitting climate for agricultural, floricultural and stock raising pursuits.

Although the greatest reputation, especially above the gap, has been made in the production of fruit and particularly apples and peaches, which are famous the world round, nevertheless the county is well adapted to dairying and stock raising, hogs, etc. Hay, hops, potatoes, melons, wheat and poultry are raised in large quantities. Practically all vegetables do well. Some localities rival California for vineyards and the production of wine for export is a great possibility. Under irrigation, wheat will yield 50 to 60 bushels and oats 80 to 125 bushels per acre, but land, excepting that suitable for dry farming alone, is too valuable for this crop. About 2,000 acres are devoted to hops and yield annually over 20,000 bales. The estimated value of the land and animal products for 1912 exceeded five million dollars and made transportation of over 20,000 carloads.

There are about 2,000,000 apple trees and nearly 600,000 peach trees in the county, representing about 40,000 acres of land. The fruit crop for 1913 was about 4,500 cars.

A recent cruise of the standing timber of the county privately owned shows 418 million feet and it is estimated that the forest reserves contain about six billion feet.

Water: This feature has been variously referred to in other subjects. Besides from streams that empty into the Yakima river, water is obtainable from wells almost anywhere in the valleys. A number of artesian wells have recently been found and from present indications many more are available. All water is pure and free from mineral or organic objections.

Transportation: The Northern Pacific and the Oregon-Washington Ry. & Navigation Co. traverse the county diagonally through the Yakima river valley. The North Yakima Valley Ry. affords a feeder to these lines from the outlying districts. The wagon roads are exceptionally well kept and heavily used. Seventy miles of the state highway will be in this county. The Sunset, the McClellan and the Inland Empire highways meet at North Yakima.

Wages: In this section with its vast agricultural resources, there is no surplus of population and no idlers. The prosperity of the land enterprises naturally tends to keep wages up to standard. Common labor wages are from $1.75 to $2.50 except at harvest time when as much as $3.00 is paid. Skilled labor commands ordinary union wages.

Markets: The coast cities absorb all the surplus hay, potatoes, vegetables, poultry, dairy and animal products, as well as much of the fruit, but the market for the latter is as wide as transportation cost will permit. Thousands of car loads annually of apples, peaches and other products go to far eastern cities and even to Europe and the orient.

Social Conditions: In planning their cities and towns social needs have been well considered. Beauty spots and play grounds are provided. Artistically designed schools of ample capacity have been built. Many pretty churches are well supported and esthetic development is encouraged. These conditions permeate the surrounding rural districts which are closely connected by mail service and rapid transit facilities. There are 26 post offices, 22 rural routes, 56 school districts and 24 high schools.

CITIES, TOWNS AND VILLAGES.

North Yakima: County seat. Altitude 1,067 feet. Incorporated. Population 1910, 14,082; in 1900, 3,154, an increase of 346.5 per cent. Present estimate, 17,500. Same ratio of growth seems to continue. Its total area is 2,355 acres. It now has a commission form of government. In architecture and engineering the most modern and approved principles have been applied. As a result of this together with its ample provisions for education, religion, comfort and amusement, it has

become a beauty spot and pride of the state. Centrally located in the midst of a rich irrigation section, it has become the county's metropolis. It has over seven miles of paved streets. The residence districts are parked and have cement walks. Its business and public buildings are of brick and stone of truly artistic designs. It has a splendid waterworks and sanitary sewer system and uses both gas and electric light, besides a central heating plant for both business and residence use. It has a paid fire department with automobile trucks; a public library; Y. M. C. A.; federal building; many fraternal buildings; a commodious court house; two large hospitals; a $125,000 high school and eight brick grade schools; two private schools, 23 churches and a public park. It is served by the Northern Pacific and Oregon-Washington Railway & Navigation railroads and it is the terminal of the Yakima Valley line. It has over 12 miles of electric street railway. There are two daily newspapers, five weeklies and one monthly. It has a number of large industries that employ 2,500 men. Among these are a lumber mill, sash and door factories, cement product plants, vinegar works, broom factory, distillery, flour mill and creameries. Bank clearings for 1912 were $21,808,020.37. The Washington state agricultural fair is held annually at this city, bringing thousands of visitors. An annual blossom festival is held in the spring.

Toppenish: Incorporated in 1907. Population 1910, 1,598. Local estimate 2,500. This city is on the Yakima Indian reservation and delightfully situated as to topography and climate. It is on the line of the Northern Pacific railway near its junction with the Sunnyside branch and is the trading center for a large district producing large quantities of potatoes, hay, sheep and cattle, and some fruit. The point has been selected as ideal for tree nurseries and the industry is carried on to a large extent. The land here is exceedingly fertile and small farms of about 5 to 10 acres are found sufficient for a family's needs. The city is modern in every way and the business blocks are chiefly of brick or stone. It has more than a mile of paved streets, a paid fire department, municipal waterworks, six churches, a four year high school and two grade schools, a pretty park covering several acres, a telephone exchange, two newspapers, a national bank and two state banks. It makes a feature of an annual Indian Round Up, a novel wild west show.

Sunnyside: Altitude 735 feet. Incorporated 1902. Population 1910, 1,379. Admirably located in the Yakima valley in the east central part of county, on the Northern Pacific and Oregon-Washington Railroad & Navigation railways. It is the metropolis of the Sunnyside reclamation project. Cattle, sheep, and hog raising and the growing of forage, corn and other food crops are a specialty, while it challenges the world in the quality and yield of all fruits not strictly tropical. It has a large tomato cannery, an ice plant, and creamery, cement walks, electric lights, municipal water plant, nine churches, a high school, public library, two parks, two banks, and two newspapers. All business buildings are of substantial character and surroundings are homelike.

Zillah: Altitude 719 feet. Incorporated. Population (local estimate) 500. Located on Yakima river in midst of rich irrigated district. It is served by the Oregon-Washington Railroad & Navigation Co. and Yakima Valley railways. Fruit, hogs, and dairy products are shipped. Business street is paved. It has a city heating plant, electric light and telephone service, three churches, a high and grade school, and one newspaper.

Mabton: Altitude 733 feet. Incorporated. Population, 1910 census, 666. On the Yakima river at the edge of the Yakima Indian reservation. It is a shipping center of the considerable animal and forage products of the Horse Heaven country, an expansive plateau of sage brush grazing country to the southeast. Surrounding lands are very fertile and irrigated or irrigable. It has municipal wells, electric power and light, five churches, a four year high and a grade school, a city park and a newspaper. A district fair and poultry show is held annually.

Granger: Altitude 650 feet. Population 1910, 453; local estimate, 650. Is in the Sunnyside irrigation project, on the Yakima river and Northern Pacific and Oregon-Washington Railroad & Navigation railways. Rich agricultural and fruit lands surround it. A large shipping business is done. It is supplied with city water, has electric power and light, two churches, a high school and grade school, a public library, and a newspaper.

Grandview: Altitude 809 feet. Incorporated. Population 1910, 320, local estimate 600. A few miles from

the Yakima river, on the Oregon-Washington Railroad & Navigation and a spur of the Northern Pacific railways, and is contiguous to a large area of splendid land under the projected high line canal. Alfalfa and fruit are shipped in huge quantities. It has a water system, electric lights, fire department, three churches, a grade school and a newspaper. One of the state experiment farms is maintained here.

Wapato: Incorporated 1908. Population 1910, 400. An active trading point in the reservation and on the Yakima river, and Northern Pacific railway with the Oregon-Washington Railroad & Navigation and Yakima Valley railways just across the river. 150 square miles of rich land is tributary.

White Swan: Altitude 1100 feet. Population about 200. A new town prettily situated amid the verdure along Toppenish Creek in the interior of the Indian reservation. Stock raising, general farming, sheep raising, fruit and hop growing are the sustaining industries. It has two churches, a high and grade school and one of the United States government Indian schools.

Yakima City: Altitude 1000 feet. Incorporated. Population 1910, 263. This was the original metropolis of the county until the advent of railroads and the founding of North Yakima. It is now a dairying center on the main line of the Oregon-Washington Railroad & Navigation and the Northern Pacific railways, three miles from the county seat.

Outlook: Altitude 667 feet. Population, about 200. An enterprising and growing town located in the Sunnyside irrigation project on a branch line of the Northern Pacific railway. Extremely rich soil surrounds the town, and much fruit, especially peaches, are produced. It has a four year high school, two churches, and electric lights.

Selah: Altitude 1100 feet. Population estimated at 200. A prosperous town supported by fruit and hop growing. It is four and a half miles above North Yakima, and connected by street cars, as well as by the Northern Pacific railway. The town supports a newspaper, and has a good grade and high school, also telephone and electric light facilities.

Naches: Altitude 1,500 feet. Population about 250 (local estimate). A prosperous village in the fertile Naches Valley. It makes a specialty of garden truck, fruit and dairying, finding a ready market at North Yakima. A number of Scotch people have settled here. Educational and church facilities are provided.

Nile: Altitude 1,950 feet. A farming village in an elevated valley well up the Naches Creek. Its business is stock raising and dairying. The storage reservoir of the Naches Reclamation Project is near here.

Byron: Altitude 878 feet. A prosperous farming and fruit raising valley on the Northern Pacific railway and near the Benton boundary.

Other agricultural and fruit raising towns and villages of the county are Moxee, Ahtanum, Cowiche and Pomona.

KITTITAS COUNTY.

Natural Features: This county lies just about in the center of the state on the eastern slope of the Cascades. Its northern and western portions consist of rugged and lofty timber covered mountains pierced by many a stream, and encircling a number of beautiful lakes. Great stretches of prairie and hills, barren of timber, but affording good grazing land for sheep and cattle, occupy the southern and eastern parts. The central portion is the famous Kittitas valley, broad and fertile, and sustaining the bulk of the county's population. Through this flows the Yakima river on its way from the Cascade mountains to the Columbia river, gathering up in its course the waters of many contributary streams. About one-half of the county is mountainous, 25% rolling and the rest level bottom and bench lands. In its wild state the Kittitas valley was covered with sage brush.

Population: According to the 1910 census, its total population was 18,561 or 91.3% more than that of 10 years before. Indications are that the growth has continued. Besides American citizens, English, Canadians, Austrians, Italians, Scandinavians and Germans compose an important part of the population.

Lands: The total area is 1,490,560 acres, of which there is included in the Rainier and Wenatchee forest reserves, 623,870 acres. In 1913 there were open to homesteading 345,545 acres of which

125,545 acres were surveyed and 220,000 unsurveyed. 120,472 acres are state lands. All the remainder is in private ownership. About 200,000 acres of the privately owned land is suitable for agriculture of which more than one-half is tillable and the remainder suitable for grazing purposes.

Soil and Climate: There is a variety of soils in Kittitas county, ranging from the gravelly loam in the north end to the rich volcanic ash and bottom lands of wonderful fertility in the central and southern parts. Hay, grain, vegetables, fruits and livestock do well. Irrigation is practised quite extensively, there being now over 70,000 acres under ditches, while the projected high line will irrigate about 80,000 acres additional. The precipitation at Ellensburg for 1912 was 10.21 inches; at Cle Elum for the same period it was 28.69 inches.

Prices of Land: Unimproved land for grazing may be purchased as low as $5.00 per acre. Land suitable for hay or grain may be purchased for $25.00 an acre up. Improved lands under water are offered at $120.00 to $500.00. Much of this is in fruit trees or other equally valuable improvements, proximity to railroads also affecting the price. Good land under the "high line" without water rights can be bought at $25.00 to $100.00 per acre. This project offers exceptional opportunities to home builders. Ten acres of fruit land or forty acres for mixed farming is considered sufficient for a family. Grazing or grain raising requires much larger areas. Opportunities exist for renting on shares.

Resources and Industries: Farming and coal mining are the two leading industries. Hay, grains, vegetables, fruits, dairy products, live stock, poultry, and bees do splendidly. There are approximately 1,500,000,000 feet of standing timber exclusive of that held in forest reserves which would increase it by about 10,000,000,000 feet more. The assessed valuation of this private timber is $1,243,307.00. A number of saw mills are in operation with an annual product of about 12,000,000 feet. Logging operations are carried on by outside milling companies, the logs being floated down the Yakima river or transported by rail for manufacture elsewhere. Coal mining is carried on extensively in the Roslyn and Cle Elum coal fields of Kittitas county, the yearly output being between one and two million tons and furnishing employment for over 2,000 men. Gold mining has been successfully prosecuted in a limited way. Many thousands of dollars worth of the precious metal have been mined. The mineral belt shows the presence of gold, silver, copper, iron, cinnabar, nickel and galena, but it is practically undeveloped.

Water: Water for all purposes is inexhaustible, being supplied by ten mountain lakes and the Yakima river with its many tributaries, while the Columbia river drains the eastern borders. Here are also the famous Priest Rapids. The mountain lakes, according to the estimate of an engineer, would supply water power sufficient to turn every wheel in Seattle and Tacoma if $2,000,000 were expended for development, and the same water could be finally conserved for irrigation.

Transportaion: The Northern Pacific and the Chicago, Milwaukee & St. Paul railways run through the entire length of the county and furnish transcontinental connections, 16 passenger trains per day stopping at Ellensburg. The public highways are numerous and kept in good order all through the year. The Sunset highway and state road No. 7 pass through the county. Daily steamboats ply the Columbia river along the eastern shore of the county from the head of Priest Rapids in the southeastern corner of the county to the important points above.

Wages: Farm labor receives from $30.00 to $45.00 a month including board. Unskilled labor receives from $2.50 to $3.50. Farms, dairies, ranges, mines and lumbering offer abundant opportunities for work.

Markets: Kittitas Valley is the first large body of open agricultural land east of the mountains nearest to Seattle and Tacoma. Its products therefore find a ready market in the big Sound cities and help to supply the heavy Alaska export trade. The tendency is for this trade to increase. Apples, and pears, are shipped to various parts of the United States, and many boxes of winter apples are sent to foreign countries. The coal finds a ready market all along the Pacific Coast as far south as San Francisco and as far east as Livingston, Montana.

Social Conditions: Churches of nearly every denomination exist. Good schools are found in both the rural districts and the towns. Rural free

delivery routes reach nearly every farm house and nearly all are connected with telephone. Many of the farm houses are lighted by gas, have steam heat, water under pressure and all the comforts and conveniences of modern homes. There are 14 post offices, 4 rural routes, 46 school districts and 6 high schools.

CITIES, TOWNS AND VILLAGES.

Cle Elum: Altitude 1,906 feet. Population 1910 census, 2,749. Third in size in the county. Located in the foothills of the Cascades on the banks of the Yakima river and on the main line of the Northern Pacific railway, about half a mile from the Chicago, Milwaukee & St. Paul road. The principal industries are coal mining and lumbering. The coal output of Kittitas county is shipped from Cle Elum, the coal of the Roslyn mines reaching there over a branch line of the Northern Pacific. It is the headquaters for considerable logging operations and an outfitting point for miners, prospectors and sheepmen. Thousands of sheep are shipped through this town on their way to the summer ranges or returning on their way to market or the winter pastures in the river valleys.

South Cle Elum: Altitude 1,900 feet. Population, estimated, 500. A freight division for the Chicago, Malwaukee & Puget Sound railway. Coal mines, timber, farm lands and water power are in the vicinity. Monthly payroll is about $15,000.

Easton: Altitude 255 feet. Population, U. S. census, 493. In the western part of the county on the eastern slope of the Cascade mountains. The Northern Pacific has a round house here, and the heavy engines, used for helpers through the mountains, are kept at this point. Much undeveloped timber is in the vicinity.

Ellensburg: County seat. Altitude 1,510 feet. Population for 1910, 4,209; for 1900, 1,737. Present local estimate 6,000. It is located in the center of the county on the main line of the Northern Pacific and Chicago, Milwaukee & St. Paul railroads, 120 miles from Spokane. The Yakima river flows near by. Sixty-thousand acres of irrigated land surround it. Resources of the county lie at its command. There exists here almost equal balance between the interests and pursuits of a modern metropolis and those of a rural trading center. It is the Northern Pacific division point, has the Washington Woolen Mills, two fifty-barrel flour mills, three creameries, four lumber yards, a glove factory and 200 other enterprises. Opportunities exist for factories. Surrounding land unimproved is from $50.00 to $100.00 per acre.

It has municipally owned water plant, electric lighting system, and a paid fire department. Three miles of streets are asphalt and 17 miles of walks are cement. It has a public library, eight churches with a total membership of 2,105, a high school, one private academy and one of the three state normals. There are three weekly newspapers and one daily. County fair is held here. Progress is being made in completing the plans for the irrigation of an additional 80,000 acres of land by the "high line canal."

Kittitas: Altitude 1,600 feet. Estimated population 225; American and Danish. A new town in a fertile valley and on the Chicago, Milwaukee & St. Paul railroad, six miles east of Ellensburg. The building of the new irrigation canal will influence future growth. It has two churches, a high school, telegraph and telephone connections, and a weekly newspaper.

Roslyn: Altitude 2,225 feet. Population 1910 census, 3,500. Austrians, Hungarians, Italians, Germans, Russians, Poles, Swedes, Norwegians, and Danes. About 20% are English speaking. It is essentially a coal mining town, which accounts for the large foreign population. One of the most important coal fields on the Pacific coast is here. The Northern Pacific railway runs across the southern end of the field and has a branch line from Cle Elum through the middle of the field to Beekman. There are six churches, two grade schools, one high schools, free public library, weekly newspaper, telegraph and telephone lines and a five and a half acre play ground controlled by school board.

Thorp: Population (local estimate) 350. A farming community in the upper portion of the Kittitas Valley, about 10 miles from Ellensburg on the Northern Pacific and Chicago, Milwaukee & St. Paul railroads. Surrounding this is the oldest irrigated section in the county. It has two churches and a high school. Between Thorp and Ellensburg is a creamery encouraging dairying on a paying basis.

Galena, a mining town, and **Boylston** are other trading centers.

CHELAN COUNTY.

Chelan county lying in north central Washington is a mountainous and rolling country, having the main range of the Cascade mountains as its western and northern boundary, while the Columbia river laves its eastern shore and receives the waters of the several streams that flow through fertile valleys, reaching into the heart of the Cascades. Within three of these valleys lie the larger portion of the best tillable area. These are the Lake Chelan region and the valleys of the Entiat and Wenatchee rivers. The connecting highway between these districts is the Columbia river. Alternating with the valleys are areas of bench lands and high rolling table lands. From 50 to 60% of the country is mountainous, 30 to 35% rolling, and 10% level.

The peculiar natural setting of the county well adapts it for a summer resort region. Forests, mountains, streams, lakes, waterfalls, and climate, aided by rich productive land, famous for the big red apple as well as other fruits, are especially inviting to tourists. Lake Chelan, from one to four miles wide and fifty miles long, is one of the most picturesque bodies of fresh water in the world.

Population: In 1900 the population was 3,931; in 1910, 15,104; a gain of approximately 284.2%. A rapid growth is still being experienced. The people are largely American born, with some Scandinavians and fewer Germans.

Land: Out of the total area of 1,856,000 acres, 1,740,880 acres are taken up by the Chelan and Wenatchee Forest Reserves, 52,526.50 acres are state land, 23,300 acres are subject to homesteading and the remainder has passed into private ownership. Altogether there are about 200,000 acres suitable for agriculture. One-half of the rest could be used for grazing.

Soil: The soil, composed of volcanic ash and decomposed granite rock, is from one to thirty feet deep. The valleys and bench lands are best adapted to fruit raising and dairying, the higher lands to hay, grains, etc. The climate is regular and very little rain falls during the summer. The annual precipitation is about 12 inches, including 8 to 14 inches of snow during the winter. Irrigation is practiced in the valleys with maximum success and profits. On the highlands some dry farming is carried on.

Prices of Land: The prices for unimproved land with permanent water right range between $200.00 and $400.00 an acre. Undeveloped dry lands may be purchased for from $5.00 to $100.00 an acre according to its proximity to the railroad and transportation centers. Improved orchard lands may be had at prices ranging from $500.00 to $1,200.00 an acre. Specially desirable pieces of income bearing orchards close to the larger cities will run considerably higher, but they will produce good interest on the prices asked. Value of improvements vary according to acreage cultivated, the number and age of trees, extent of fences and flumes, character of buildings, etc. Five to 10 acres of fruit land is sufficient for an ordinary family. Opportunities for leasing improved land on shares are occasionally offered.

Resources and Industries: The production of the famous red apple, with peaches, pears, apricots, cherries and plums in the order named has been the main industry of the region. In this respect it is one of the two leading counties in the state, having a total acreage of apples alone of nearly 35,000 acres. The fruit crop for the county in 1913 was over 4,000 carloads, 3,924 of which were apples. Soil and climate are particularly well adapted for such enterprise. Grain, hay, potatoes and other farm products grow extensively and would pay well if greater attention were paid to their production. Dairying, stock raising, lumbering, and mining are also important, but much less developed. The ores found are quicksilver, copper, gold, gypsum and zinc.

Water: Wonderful water power is available; Chelan river and lake, 300,000 H. P.; Wenatchee river, 25,000 H. P.; Entiat river, 15,000 H. P.; Icicle and Snow creeks, 15,000 H. P.; Columbia river, 400,000 H. P. There are a great many smaller streams with from 100 to 500 horse power. There is also an unlimited supply of pure mountain water for every other known purpose.

Transportation and Markets: The main line of the Great Northern running in a general east and west direction, the Wenatchee-Oroville branch from Wenatchee to Oroville, and the Wenatchee Valley from Leavenworth to Wenatchee Lake are the railroads of the county. A branch line also runs from Leavenworth to Waterville and Mansfield in Douglas county. These lines with steamboat transportation on

the Columbia river and on Lake Chelan, with regular auto stage service to interior points, and with many public highways in good condition, make all inhabited portions of the county easily accessible. The completion of the Cascade scenic highway from Wenatchee to Seattle over the Cascade mountains will furnish an auto road for many trans-continental tourists. The products of the county find ready markets in the produce centers of the United States, England, France, Germany and Australia. Fair prices have always prevailed.

Wages: For general farm work wages paid range from $30.00 to $40.00 per month, with board. Wages without board run from $2,25 to $2.75 per day. Work is usually available the year round and in all lines of organized labor including mining, lumbering, etc., but a special demand exists for workmen in the harvest season. Fruit pickers get $2.50 per day and packers about $4.00 a day. Unskilled common labor is paid from $1.50 to $2.50 per day, while skilled workmen receive a daily wage of from $3.00 to $5.00. Where this latter work is distant from town, board and room are generally furnished also.

Social Conditions: Social conditions are all that can be desired. There are churches of every denomination; schools of recognized excellence; branches of leading fraternal organizations; newspapers of merit; telegraph and telephone connections; and the usual comforts and conveniences known to modern civilization. The "Fair Hesperides" is held at Wenatchee in the month of October. The variety and quality of the exhibits displayed are convincing evidences of the wonderful productive powers of the region. There are 25 post offices, 8 rural routes, 55 school districts and 11 high schools.

CITIES, TOWNS AND VILLAGES.

Wenatchee: County seat. Altitude 680 feet. Population 1910, 4,050. In 1910 only 451. Local estimate 5,500. Area three square miles. Its growth represents the development of the Wenatchee valley from a sage brush slope into one magnificent orchard. It is picturesquely situated at the confluence of the Wenatchee and Columbia rivers with the foothills of the Cascade mountains two or three miles away. It is now the financial center for north central Washington and the largest city on the Great Northern railway between Spokane and tidewater. It is also served by the Wenatchee-Leavenworth-Mansfield branch, the Wenatchee-Oroville branch and regular boats on the Columbia river, as well as by regular auto stage to all the main points in Chelan, Douglas and Okanogan counties. It is a shipping point for a vast fruit growing section, also for much wheat raised in the "Big Bend Country." In 1912, 3,118 cars of fruit were shipped. The production for 1913 will be about the same.

The city has excellent water supply and electric lights supplied by the Wenatchee Valley Gas and Electric Company, eight miles of paved streets, and a paid fire department. There are 10 churches, four grade schools and one high school, a public library of 3,300 volumes, a city park and fair grounds; two daily newspapers and two weeklies.

Leavenworth: Altitude 1,165 feet. Population 1910, 1,551. Local estimate 2,000. A rapidly growing and active city. Terminal point of Great Northern railroad with monthly payroll of $25,000.00 to $30,000.00. Surrounded by mountains 1,000 to 7,000 feet high with outlets on the east, north and west. Nearby is abundance of fruit and farm lands. Two large lumber companies operate here with saw mills, planers, and box factories and with a capacity for from 25 to 40 million feet. There is also a steel manufacturing plant. Vast water power, quantities of limestone, marble, asbestos, and other minerals are available. City has brick business blocks, two newspapers, four churches, a high school, grade school, public library, telephone system, public park, electric lights, splendid water, and a volunteer fire department.

Cashmere: Altitude 978. Population 1910, 625. Local estimate 1,000. Located on the main line of Great Northern railroad and in the very center of the Wenatchee Valley, it has become the distributing point for the "Vale of Cashmere." It is surrounded by a vast belt of timber which keeps two saw mills and two box factories busy. Many acres of fruit land are tributary and about 1,100 cars of fruit are shipped annually. City has electric lights, municipal water, volunteer fire department, seven churches, a high school, two grade schools, public library, telephone system, city park, and one weekly newspaper.

Chelan: Altitude 1,120 feet. Population 1910, 682. Local estimate 800. Transportation is by stage to Wen-

atchee and Chelan Falls, and by Columbia river steamers. It lies at mouth of Lake Chelan on both sides of the Chelan river and four miles from the nearly completed Oroville-Wenatchee branch of the Great Northern railroad. Much very fertile irrigable and non-irrigable land is tributary and the city is doubtlessly destined to become a beautiful summer resort. The Chelan river, in a course of only four miles, has a sheer drop of nearly 400 feet, producing about 100,000 H. P. It has a large saw mill, five churches, high school, telephone system, electric lights, volunteer fire department, two weekly papers and a public park.

Lakeside: Altitude 1,180 feet. Population 1910, 222. Local estimate 360. Located by the lake just west of Chelan, which it resembles in transportation facilities and general surroundings. Town is supported by farming and fruit faising. It has city water, electric lights, one church and a good school. Good opportunities for investment exist.

Monitor: A fruit center of about 300 population in the Wenatchee valley between Wenatchee and Cashmere, and on the Great Northern railroad. About 700 cars of fruit are shipped annually. It has a high school, church and electric lights.

Other centers are Entiat at the entrance to the Entiat valley, Peshastin, Dardanelles, Stehekin, a summer resort at the head of Lake Chelan, Brief, and Maplecreek, Malaga, Chiwaukum, Dryden, Blewett, Merritt, Manson, Farris, Lucerne, Lone Rock, Dover and Moore. Atlogether there are 24 post offices in the county.

OKANOGAN HIGHLANDS.

OKANOGAN COUNTY.

This county enjoys the distinction of containing the place where the first white settlement under the American flag in the state of Washington was started.

Topography: It is the largest county in the state and has a total area of 5,221 square miles. About 15% of the county consists of low mountain ranges cut up into rich fertile valleys. The highest of these mountains are in the northeastern part of the county and near the western boundary. The Okanogan river flowing nearly due south into the Columbia, cuts the county into two almost equal parts. Many smaller streams flow into this from both directions, while the Methow emptying also into the Columbia drains the western portion of the county. Within these two valleys are vast areas of level land much of which is river bottom and fertile plateaus of many acres in extent. The south half of the county east of the Okanogan river is included in the Colville Indian reservation. The elevation varies from 750 to 8,300 feet.

Population: The census report for 1910 gives the county a population of 12,887; while the report for 1900 shows only 4,689, nearly 175% increase in ten years. The proportion for the past three years is undoubtedly even larger while the next few years will probably bring other great changes, as the important development work now under way progresses. About eighty per cent of the people are American born, with Canadians, Germans, English and Scandinavians ranking in the order named. The largest share of the population is to be found in the two large valleys mentioned above.

Lands: The total area of the county is 3,341,440 acres. Out of this the United States holds, in forest reserves, 1,962,740 acres, in the Colville Indian Reservation over 600,000, and in unreserved and unappropriated lands 209,418 acres. The state holds 72,252.51 acres, leaving in private ownership over 500,000 acres.

The greater portion of the best agricultural land lies in the Okanogan and Methow river valleys, both of which are noted for soil fertility. The highlands are splendid for the production of grain. About 25% of land (not considering reserves) is tillable and the balance suitable for grazing. Irrigation is practiced quite generally in the valleys. The government irrigation project watering 10,000 acres is around Omak.

It is believed that the Colville Indian Reservation extending also into Ferry county will be thrown open to settlers within the near future. Within

this is some of the best land in the state.

Soil: The soil is composed of a rich loam in some portions and in others of the fertile volcanic ash. Along the Okanogan valley the soil is mostly a fine volcanic ash mixed with sand in varying quantities. The subsoil is usually sufficiently porous to insure excellent drainage and prevent souring of the land.

Prices of Land: Unimproved land is being offered at from $10.00 to $100.00 per acre, according to its character and location. Where sage brush prevails the cost of improving is approximately the same as in similar sections of eastern Washington. Improved land may be purchased at from $20.00 to $250.00, the price being governed by the nature of improvements and the location of the land. The larger prices are for irrigated orchard lands which in many cases will run even higher. There are some opportunities for leasing improved lands on shares.

Resources and Industries: In the early days grazing constituted the chief industry. It is still of great importance and the county now ranks among the first in the production of beef cattle. Wheat and oats however are assuming some importance on the uplands while fruit and alfalfa are rapidly gaining in the valleys. It has the fourth largest number of apple trees in the state. Much attention is also given to dairying. Mining development has been slow. The mineral deposits are gold, silver and copper. Near Oroville large deposits of epsom salts are to be found. There is also considerable standing timber.

Water: The Similkameen river is capable of furnishing some 10,000 horse power, and the Methow river, now undeveloped, has potential power of large magnitude, while many small streams may also be utilized for generating energy. Water for irrigating purposes is ample for all of the demands which are likely to be placed upon it. Three large rivers and many small streams as well as lakes furnish a good supply. For domestic uses it is obtained from wells, which may be sunk with very little trouble, or taken from the upper Okanogan and the smaller streams.

Transportation and Markets: In the past lack of transportation facilities have tended to hold back the development of this county. River boats have been the chief means of carrying products and supplies, and they will continue in importance for the transportation of non-perishable freight. Regular boat service exists at present throughout the year between Brewster and Wenatchee, but the Okanogan is navigable only during the spring months. In the future, however, the Okanogan extension of the Great Northern reaching from Wenatchee to Oroville, will afford rapid transit to the important markets of the world, including Vancouver, B. C., Spokane and the coast cities. Many cattle and sheep are now shipped direct to Chicago and other eastern markets.

The county is to have secondary state roads Nos. 10, 12 and 13. Present roads are good and regular automobile stages run between the main centers.

Wages: The general run of work consists principally of such labor as is incident to farming pursuits and caring for stock. The usual wage is from $40 to $60 a month with board. Skilled labor receives from $4 to $6 a day. A limited amount of employment for unskilled labor may be found in the lines of horticulture, mining, and highway, railroad and ditch building. The wage corresponds to that offered for farm labor.

Social Conditions: Schools and churches are found wherever needed. Telegraph and telephone lines reach nearly every settlement and the rural free delivery of mail serves most of the county. Civic clubs and fraternal bodies are found in the larger settlements. Ten newspapers keep the residents in close touch with all doings of the outside world. There are 68 school districts, 17 high schools and 35 post offices.

CITIES, TOWNS AND VILLAGES.

Okanogan: Altitude 850 feet. Population (census 1910) 611. Estimated 800. Situated on the Okanogan river and Great Northern railway. It has a flour mill, two planing mills, three saw mills, a creamery, and spraying material factory, while in the immediate vicinity fruit growing and general farming is successfully carried on. A large body of irrigable land is adjacent. The town possesses four churches, grade and high school, free library, local telephone service, two parks, a newspaper, municipal water system, and a fire department.

Oroville: Altitude 930 feet. Population (1910 census) 495. Present estimate 800. A growing town, located on

the Great Northern railway, five miles south of international boundary line. Considerable mining is done in the vicinity. Surrounding uplands are planted to grains, and the valley lands, under irrigation, to fruit and alfalfa. Two irrigation districts covering 10,000 acres of choice lands are adjacent. It has railroad machine shops and a creamery, also four churches (Episcopal, Presbyterian, Methodist, and Catholic), one high and two grade schools, local and long distance telephone service, weekly newspaper, modern water system, electric lights, and volunteer fire department. The surrounding country is beautiful and the city gives promise of growth.

Pateros: Altitude 780 feet. Population (local estimate) 316. Situated at the confluence of the Methow and Columbia rivers, it is served by steamboat and the Great Northern railroad. There are 1,500 acres of land under irrigation close by with 14,000 more to be irrigated very soon, also a large area of dry farming lands not far away. It is an important shipping point for cattle. Three religious denominations are represented. One high and two grade schools, local and long distance telephones, and one newspaper are maintained.

Riverside: Altitude 856 feet. Population 250. Beautifully located in a rich valley at the head of navigation on the Okanogan river and the Great Northern railway. Diversified farming such as dairying and fruit, stock and poultry raising support the town. It has a lumber mill, planing mill, box, sash and door factory, one church, one grade and one high school, telephone service, and a newspaper. The Okanogan County Fair and Interscholastic Athletic meet are held here annually.

Twisp: Altitude 1,619 feet. Population, 1910, 227. Local estimate for 1913, 375. Situated near the center of the Methow valley. Diversified farming is successfully practiced and many beef cattle are shipped. Saw mills and mines are also wealth contributors. It has a large creamery, four churches, one grade and one high school, local telephone system and a weekly newspaper. The Methow Valley Fair is held here annually. Transportation is by stage to Pateros.

Winthrop: Altitude 1,765 feet. Population of town itself about 100. In the immediate district there are estimated to be 1,000. Situated at the junction of the forks of the Methow river, it becomes the upper trading point in the Methow valley, a rich farming country. It has no railroad, but regular automobile stages give good survice. General stores, a creamery, two saw mills, a fruit cannery, two churches, good school facilities, telephone service, public park and a weekly newspaper are maintained.

Conconully: County Seat. Altitude 2,817 feet. Incorporated 1908. Population 1910, 257. It started in 1888 as a mining town. Productive mines which support a smelter and afford a cash revenue for the town are still being operated near by. The town is sixteen miles west of the Columbia river but will soon by served by a branch line of the Great Northern railway now operating along the river. It has a three year high school, a grade school, and one church. It is served with telephone, electric lights, and a volunteer fire department.

Brewster: Altitude 800 feet. Population 1910 census, 296. Present estimate 400. Town lies on level bench 30 feet above Columbia river near its confluence with the Okanogan. Daily boats come up and down the river. The Wenatchee-Oroville branch of the Great Northern passes through. Town is supported by fruit culture and stock raising without and a saw mill within. There are three churches a high school, and newspaper. Close by is the site of Fort Okanogan, the first settlement and fort in the state of Washington.

Chesaw: Altitude 2,927 feet. Unincorporated. Estimated population 200. The town lies in a beautiful valley in the foothills of the Cascade mountains three miles distant from the Great Northern railway. Farming, mining, lumbering and cattle and sheep raising are important in vicinity. There is a Methodist church, a high school, and newspaper.

Omak: Altitude 850 feet. Unincorporated. Estimated population 300. It is situated on the Great Northern railway and Okanogan river in the center of the government irrigation project irrigating 10,000 acres. It is the natural gateway to the Colville Indian Reservation. Orcharding and general ranching are the sustaining industries. Orchard lands close to town sell for from $250.00 to $500.00 an acre. General farming lands are offered as low as $25.00. There is one church, a high school, and weekly newspaper.

Methow: Altitude 1,158 feet. An attractive settlement situated on the banks of the Methow river 12 miles

from its mouth. Excellent fruit is produced on the irrigated valley lands, and grain on the drier uplands. Gold, copper and antimony have been discovered in the contiguous mountains.

Tonasket: Altitude 900 feet. Population (local estimate) 200. A new town located on the Okanogan river in the midst of a rich diversified farming region, about 20 miles from the boundary line. Within a radius of four miles seven valleys join with the Okanogan. Town has a flour mill, creamery, three churches, and good school facilities. Good opportunities exist. The Wenatchee-Oroville branch of the Great Northern passes through.

Other important towns and trading centers are Nespelem, Chopaka, Loomis, Beck, Anglin and Bodie.

FERRY COUNTY.

Ferry county is in the middle of the stretch of country known as the Okanogan Highlands in the northeastern part of the state and midway between the Cascade and Rocky mountains.

Topography: It presents a beautiful combination of mountains, rolling hills, and low ridges interspersed with valleys, green fields, streams and lakes, with a general slope toward the Columbia and Kettle rivers. Water thus more than half encircles the entire county. The Kettle river and Curlew valleys have at present received most of the development, although nearly all parts are endowed by nature for the happiness of mankind. About 20% of the county is rolling, 20% level and 60% either hilly or mountainous.

Population: The 1910 census enumerates a population of 4,800. A steady growth has taken place since. Americans predominate. Scandinavians and Germans are well represented.

Lands: The county contains a total area of 1,420,800 acres. The southern half, however, comprising about 700,000 acres is held in the Colville Indian reservation, while 514,934 acres out of the northern half are included in the Colville Forest Reserve. 25,154 acres more belong to the state and 29,812 acres of Federal lands are open to homesteading, leaving in the hands of private owners not more than about 130,000 acres. It is thought that the Indian reservation will be thrown open to settlers within the near future. About one-half of the county is tillable and the remainder good for pasture.

Soil and Climate: The soil in the valleys is a black loam from one to five feet deep, eminently suitable to diversified farming. The plateau soil is a clay loam and very fertile. Wheat, barley, oats, alfalfa, timothy, potatoes, roots, fruit and berries all thrive in this soil. The climate is mild and irrigation is not practiced, the rainy season providing ample moisture. The annual precipition at Republic is about 18 inches.

Prices of Land: Much unimproved land may be had at from $5.00 to $10.00 an acre, with the cost of improving estimated at from $5.00 to $30.00. Improved lands (not so plentiful) bring from $10.00 to $100.00 an acre. Improvements consist principally of fences and buildings. Improved lands may be leased on the basis of one-third of crop to owner. Cultivated Indian allotment lands can be leased for a term of from one to five years at a yearly rental of $1.00 to $1.50 an acre. Eighty acres will make a splendid home.

Resources and Industries: Dairying, stock raising, mining, lumber manufacturing, and diversified farming constitute the main industries. Some of the richest gold mines in the state are in this county and bid fair to yield heavily in the future. The main timber resources are locked up in the reserve. There is abundance of water power, but none has yet been developed. This is also one of the finest game counties in the state.

Water: There is a plentiful supply of water available for irrigation purposes, but thus far there has been very little irrigating done. An abundant supply of excellent quality for domestic uses is supplied by springs and mountain streams.

Transportation and Markets: The Great Northern and Spokane & British Columbia railroads run through the central and northern portions of the county. The Columbia river, along the eastern side, is navigable between Bridgeport, in Douglas county, and Kettle Falls in Ferry county. State road No. 4 runs from the southern line to the north-central portion of the county, forming a junction at Republic with state road No. 13 which crosses the entire county at that point from west to east. The county roads are kept in good condition throughout the

year. Republic, Spokane and the cities of British Columbia furnish a good market for all products of the county.

Wages: Work is found in the farming districts during the seasons with wages paid at the rate of $40.00 a month with board and $60 without board. Work may be had in the saw mills, tie, and logging camps with daily wage of $2.00 for unskilled and $4.00 for skilled labor. In mining camps wages average $3.50 per day.

Social Conditions: The social conditions will compare favorably with the older and more settled counties of the state. Churches, grade and high schools are plentiful and conveniently located. Mail, telegraph and telephone facilities are adequate and reach every section. Commercial clubs and fraternal organizations are found in the settled communities. There are 14 post offices and 29 school districts.

CITIES, TOWNS AND VILLAGES.

Along the Great Northern, the Spokane & British Columbia railroads and the Columbia river there are innumerable stations and towns, each important as a shipping point. Those having postal service are Republic, Boyds, Covada, Curlew, Danville, Ferry, Inchelium, Keller, Laurier, Lorin, Malo, Meteor, Orient and Rockcut. The towns of more importance are Boyds, Curlew, Orient and Republic.

Orient: Altitude 1,500 feet. Estimated population 200. Town is on the Great Northern railway and the Kettle river, in the northeastern part of the county. It was formerly supported entirely by mining and lumbering but now dairying, stock raising and grain growing have become important industries. One hundred thousand bushels of wheat were produced here in 1912. Saw mills, wood working factories, brick and pottery plants and kindred enterprises would be successful.

Republic: County seat. Altitude 2,682 feet. Population 1910, 999. Present local estimate 1,600. It was primarily a mining town and is still famous for the wonderful quartz mines surrounding. It is the county terminal of the Great Northern and Spokane & British Columbia railroads. Natural setting among hills covered with clusters of pine, fir and tamarac timber make it especially beautiful. Mining and quartz milling are principal industries. There are two cyanide ore reduction plants, of which one is in active operation. About 200 tons of ore are shipped daily and 100 tons treated locally. Monthly payroll for city is about $30,000.00. Surrounding country is suitable for horticulture, cereal raising and general farming. A number of saw mills are also operated in the vicinity. It has four churches, one high and two grade schools, pump and gravity water system, electric lights, volunteer fire department, telephone system, and two newspapers.

Curlew: Altitude 1,850 feet. A dairying center located on the Kettle river near the northern boundary line. Stock raising and lumbering are important in the vicinity. The Great Northern and the Spokane & British Columbia railroads give excellent service.

STEVENS COUNTY.

The county orginally comprised, in addition to its present territory, what is now known as Ferry and Pend Oreille counties. Ferry county separated by the Columbia and Kettle rivers bounds it on the west, while a ridge of mountains is the dividing line from Pend Orielle. The Colville river having its source in Loon Lake, flows northwest till it empties into the Columbia a few miles below the mouth of Kettle river. Within this valley is the largest area of the county's agricultural land. The entire county was covered with timber, only a small portion being as yet cleared up and devoted to agriculture. Many pretty lakes are to be found in various places, while the natural scenery caused by mountains, forests, and valleys, vies with most parts of the country.

Population: The combined population for Stevens and Pend Oreille counties was 25,297 in 1910. Of this it is estimated that about 7,000 belonged to Pend Oreille county, leaving over 18,000 to Stevens. It is safe to estimate considerable growth in this section of the state during the past three years, as much development has been taking place.

Lands: Total area of county is 1,575,680 acres, of which 147,442 acres are included in the Spokane Indian Reservation in the southern end of the county, and 63,080 acres in the Colville Forest Reserve. In addition there are 139,351 acres of unappropriated and

unreserved Federal lands, described as mountainous, farming, and mineral, and 100,768 acres of state lands. This leaves more than a million acres already in private ownership, much of it being homesteads not yet proved up, logged-off areas owned by milling companies, and timber lands. About half of the county holds splendid prospects for agricultural development, and will make an excellent dairying section. Bulk of land is in the Colville valley, but there is also much along the Columbia and Kettle rivers. In the Columbia river valley is much irrigated land where fruit raising is carried on in addition to hay and grain.

Soil: Along the river valleys the soil is a heavy black loam with a subsoil of yellowish clay. The plateaus partake of the volcanic ash nature. Diversified and intensive farming can be carried on successfully, the land being well adapted to products of a temperate climate. Precipitation is from 20 to 25 inches yearly.

Prices of Land: The prevailing prices for unimproved land ranges from $5.00 to $30.00 an acre, in most parts of the county the price being regulated largely by proximity to railroads and suitability for agriculture. It is estimated that this can be placed under cultivation at from $10.00 to $60.00 an acre. The prices for improved land range from $50.00 to $100.00, governed by the nature of improvements and distance from railroads. There are pieces in the Columbia river valley set out to fruit that will cost considerably more. There are as good opportunities to get cheap land in this county as in any part of the state. It is estimated that from 40 to 160 acres, excepting irrigated parts, would be sufficient for the needs of the ordinary family. Opportunities exist for the leasing of lands on a basis of about one-third of the crop delivered.

Resources and Industries: The resources of this county are quite varied. Over three-billion feet of standing timber remain, while indications of considerable mineral deposits, including gold, silver, copper and lead, are found in the mountains. There are also large deposits of marble, including a wide range of colors from pure white to blue. The water power is unlimited especially in the Columbia river at Kettle Falls. Saw mills are in nearly every town along the Colville valley. In this valley also and along the Columbia river are many acres of splendid agricultural land, along the Columbia there being considerable irrigation carried on. Much fruit is raised here while timothy, alfalfa, oats, wheat and corn have all been found suitable for the soil.

Transportation and Markets: The Columbia river is navigable for a distance of 150 miles between Kettle Falls and Wenatchee. The Great Northern railway traverses the county from Clayton in the southeastern corner to Boundary on the Canadian boundary line.

The Central Washington highway, a primary road under construction by the state, crosses from southeast to northwest. State road No. 2, having its starting point at Orient, in Ferry county, crosses from east to west into Pend Oreille, thence south to its termination at Newport on the Idaho state line. The principal market for produce not needed in the county is Spokane.

Wages: The usual wages paid for labor, including board, amounts to $35.00 to $40.00 a month. Unskilled labor is paid from $2.50 to $3.00 a day. Sawyers get $4.00 to $5.00, and filers $7.00 to $9.00 per day. The saw mills and timber camps as well as the farms give plenty of opportunities for obtaining work.

Social Conditions: A high standard generally prevails in this county. It contains 49 post offices, 10 rural routes, 126 school districts, and 15 high schools. Fraternal organizations, commercial clubs, churches of all denominations, newspapers, telephone and telegraph facilities, minister to the people's needs in the various communities.

CITIES, TOWNS AND VILLAGES.

Colville: County seat. Altitude 1,650 feet. Population, census of 1910, 1,512; estimated 1913, 2,200. Mostly American. Situated in the northern end of the Colville valley where that valley broadens out to include much rich agricultural area. It is the center of a very productive fruit raising, mining and timber section located 87 miles north of Spokane on the Great Northern railway, having direct telegraph and telephone connections with Spokane and with Rossland and Nelson, British Columbia. Town has three banks, first class hotels, two newspapers, a creamery, hospital, new $9,000 post office, flouring mill, brick yard, cement block factory, tombstone

factory, electric light and power plant, a big saw mill with dry kiln and fifteen other saw mills in the immediate vicinity, nine church organizations, one grade school, a $35,000 high school, sixteen fraternal bodies and an active Chamber of Commerce which assumes most of the public responsibilities of the town. An annual street fair and agricultural exhibit is held at Colville during September.

Chewelah: Altitude 1,668 feet. Population 1910, 823. Local estimate 1,500. Located on the Oroville branch of the Great Northern railroad in the Colville valley. Much fertile farming land suitable for dairying and fruit production surrounds it. Mining is one of the leading industries. This, together with lumbering and development of farms, has caused a rapid growth. A big brick plant is also here. Work exists here during almost the entire year at good wages. Town has municipal water system, municipal electric lighting, paved streets, volunteer fire department, six churches, a high school, two grade schools, a private school, telephone system, city park and one newspaper. An annual agricultural fair and school exhibit is held here.

Gifford: Altitude 1,800 feet. Population, local estimate 150. An agricultural and trading center on the upper Columbia river. Some lumbering is carried on in vicinity. It has a pipe factory, box factory, and monthly paper. Successful farming is carried on both with and without irrigation.

Hunters: Altitude 1,640 feet. Population (local estimate) 300. Situated in Hunters valley near the Columbia river. A splendid garden spot where land is successfully worked either with or without irrigation. Transportation is by boat, with the Great Northern railroad building to Spokane river. Town has a creamery, a high school, three churches, and electric lights.

Kettle Falls: Population 1910, 377. Located in the midst of an irrigated section known as the Kettle Falls Valley. Fruit, especially apples, are successfully grown. Nearby are the falls of same name, often called the "Niagara of the West." Town has a high school, and four churches, city owned water and electric lights.

Springdale: Population (local estimate) 250. Located on the Great Northern railroad 47 miles north of Spokane. Area one square mile. A timbered region that is rapidly being cleared and placed under cultivation. Much good agricultural land is here. Logging is important and several saw mills are in the vicinity. It has good schools, congregational church, electric lights, telephone system, and a newspaper.

Marcus: Altitude 1,280 feet. Estimated population 600. Area two square miles. A truly western town and Great Northern railroad center located near the junction of the Columbia and Kettle rivers. In the vicinity are mining, lumbering and agricultural resources which are gradually being developed. The Great Northern round house and shops maintain a good payroll. There are three churches, a high school, good water supply, electric lights, volunteer fire department and newspaper.

Northport: Altitude 1,335 feet. Estimated population 500. Beautifully situated in the northern part of county on the bank of the Columbia river, with a commanding view of mountains, valleys, and river. Transportation is by Great Northern railway. There are marketed here many cedar poles, ties, saw timber and wood. Dairying and diversified farming are carried on. Town has two churches, a high school and newspaper.

Clayton: Altitude 2,252 feet. Estimated population 350. Located in the midst of a good dairy and fruit section, 31 miles from Spokane by the Great Northern railway. A $350,000.00 brick and terra cotta plant supplies a pay roll of about $15,000.00 per month. Some saw mills are in the vicinity.

Other important towns and trading centers are Orin, Kane, Harvey, Boundary, Gerome, Bossburg, Arden, Fruitland, Bissell, Cedonia and Blue Creek.

PEND OREILLE COUNTY.

Pend Oreille county, the newest county in the state, was organized in 1911.

Natural Features: It is situated in the northeastern corner of the state with the Canadian and Idaho lines for its northern and eastern boundaries. A river of the same name traverses the county from the southeast to the northwest and, after receiving the waters of many tributary creeks, joins with the Columbia at the Canadian boundary line. It is navigable in the southern part but becomes more turbu-

lent as it works through the mountainous country above Ione. The agricultural area lies chiefly in the valleys formed by the river and its tributaries and is bounded by the mountain ranges that extend on either side practically the entire length of of the county. Altogether about 50% of the county is rolling, 5% level and 45% mountainous. There are many lakes in the county, of which the principal ones are Sullivan, Bead, Calispel, Diamond, and Sacheen.

Population: The estimated population of the county is about 7,000 of which 70% are American born, the remainder being Scandinavians, Greeks, Austrians and Bulgarians.

Lands: The approximated total acreage amounts to 898,560, of which there are held in the Kaniksu Forest Reserve 397,936 acres; surveyed government lands, 35,661 acres; unsurveyed government lands, 39,011 acres and state lands 43,618 acres. The tillable lands will approximate some 450,000 acres while the balance of the county, now accounted as non-tillable, is well adapted to grazing and stock raising. It is estimated that about 10% is bottom land and about 90% bench land. Diversified farming can be profitably carried on and irrigation is unnecessary. As this is a new county with a comparatively small amount of development there is considerable land to be obtained. Many homesteads are as yet not patented.

Soil: Level and bottom lands along the rivers, creeks, and lakes, are composed of deep rich loam suitable for grains and grasses. The balance of the tillable land is of the red volcanic ash formation highly adaptable to fruits, berries and grasses. Most of the non-tillable land is suitable for grazing. Mild winters and temperate summers prevail.

Price of Land: Unimproved land may be had at prices ranging from $3 to $25 per acre, with the cost of putting it under cultivation estimated at from $10.00 to $60.00. Improved land is offered at from $50.00 to $100.00.

Resources and Industries: Agricultural lands, immense bodies of timber and many mines, all play important parts in enhancing the county's wealth. It is estimated that there are over 10,000,000,000 feet of timber in the county, enough to last the present mills many years. Mining is just beginning to develop. Lumbering and cultivation of grains and grasses form the main industries. Considerable grazing is also carried on.

Water Power: An almost unlimited water power is supplied by the Pend Oreille river. Sullivan creek now operates a $1,000,000 cement plant. On the 29th day of July, 1913, the interior and agricultural departments of the United States approved a power permit to the International Power & Manufacturing Company for the development of a power project at Z Canyon on Clark Fork. This will result in one of the largest projects in the country for the development of cheap power. At low stages of water, 120,000 continuous horse power can be developed, and by storage reservoirs this minimum can be brought up to 350,000 horse power. The permanency of this grant depends on careful adherence to the general regulations. The maximum rate to the public is fixed at six cents per kilowatt. If the company charges are less, the government rates to the company are less in proportion.

Transportation and Markets. The main line of the Great Northern railway runs across the southeastern corner of the county. The Idaho & Washington Northern railroad parallels the Pend Oreille river along its entire course as far as Metaline Falls.

No trouble is experienced in disposing of products at fair prices. Outside of the county Spokane is the chief market.

Wages: Farm labor is paid from $30.00 to $50.00 a month, with board. During harvest the wages are from $2.00 to $3.00 a day. Unskilled labor receives from $2.50 to $3.00 a day and skilled labor $3.00 to $6.00 a day.

Social Conditions. Churches and schools are sufficient. Telegraph and telephone lines reach to every settled community. Newspapers, fraternal organizations and commercial clubs are found in the larger towns. There are 31 school districts and 3 high schools.

CITIES, TOWNS AND VILLAGES.

There are twenty-one post offices as follows: Blueslide, Calispell, Camden, Cement, Crescent, Cusick, Dalkena, Ione, Jared, Locke, Lost Creek, Metaline, Metaline Falls, Newport, Penrith, Ruby, Scotia, Sullivan, Tiger, Tweedle and Usk. Each serves as a shipping point and trading center. Several of them are important for lumber manufacturing.

Ione: Altitude 2,097 feet. Population 1910 census, 634. Mostly Ameri-

cans. Situated on the Pend Oreille river and the Idaho & Washington Northern railroad. Has gravity water system, electric lights, paved sidewalks, good streets, one church used by several denominations, one grade school, one high school, local and long distance telephone, and a weekly newspaper.

Metaline Falls: Altitude 2,450 feet. Estimated population 400. Started in 1910. Situated in the northern part of the county at the terminus of the Idaho & Washington Northern railroad in the valley of the Pend Oreille river. Main support is derived from the cement business, mining and lumbering. A million dollar cement plant shipping from 10 to 18 car loads daily. Town has cement sidewalks, good streets, a church, a $20,000.00 school building, water system, electric lights, local and long distance telephone lines and a weekly newspaper.

Newport: County seat, and main shipping point and trade center for the county. Population 1910, 1,199. Local estimate 1,800. Prettily situated at the junction of the Idaho & Washington Northern and the main line of the Great Northern railways overlooking the Pend Oreille river 60 feet below. Townsite is intersected by Idaho boundary line.

Lumber industry, agriculture, fruit raising and mining will assure future growth. It has all branches of business, including one lumber company with 20,000,000 feet capacity annually, also several wood working plants and one saw mill. There are five churches, a high school, several fraternal organizations, and one newspaper. Sidewalks are paved.

BIG BEND AND PALOUSE GROUP.

DOUGLAS COUNTY.

Douglas county, situated in the central part of the state, consists principally of a plateau of from 2,500 to 3,000 feet altitude.

Natural Features: The Columbia river, forming the north, west and south boundaries, causes some broken land back from the river for a few miles. About 60% of the surface is rolling, 30% level and 10% toward the west low mountain ranges. Only by getting on this plateau can its greatness be conceived, as nothing but the jagged rocks or a narrow strip of irrigated land can be seen from the Columbia river or the train window. On the top it is nearly all one magnificient wheat field extending to the horizen in nearly every direction. It is broken also by Moses Coulee, an old river bed extending in a northeasterly direction from the southern limit, while Grand Coulee forms its eastern boundary.

Population: The 1910 census accredits it with a population of 9,227 as against 4,926 in 1900, an increase of 87%. Much increase has taken place the past three years. The citizenship is mostly American, augmented by Scandinavian, Scotch, Irish, Danish and German.

Lands: There are approximately 1,143,680 acres of land, of which 79,160 acres are subject to homesteading and 95,502.74 acres are owned by the state, leaving under private ownership over 900,000 acres. Altogether there are practically 1,000,000 acres of tillable area the remainder being adapted for stock grazing and kindred uses. Dry farming is practiced almost altogether, the precipitation averaging 13½ inches annually. Along the Columbia and in the coulees irrigation is found to be advantageous and very easy of accomplishment.

Soil: The soil is a volcanic ash of about five feet in depth, with clay and hardpan as sub-soil. It is very fertile and is admirably adapted to the production of grain, esoecially wheat.

Prices of Land: There is considerable land of excellent quality offered for sale. The unimproved is listed at from $10.00 to $25.00 per acre with the estimated cost of putting it under cultivation priced at from $3.00 to $5.00. The improved land, plowed, fenced and usually with some buildings, can be bought at from $15.00 to $60.00 for dry farming. Irrigable land set to trees, some bearing, may be purchased at $200.00 and upward per acre. The highest priced land, of course, has orchards in full bearing and tributary to the famous Wenatchee valley.

Water: The only water available for

irrigation purposes is along the river and creeks. For domestic purposes wells are sunk and an abundance of excellent water is usually obtained at a reasonable depth.

Transportation and Markets: The Great Northern Railroad traverses the county from Mansfield in the north central portion south to the Columbia river, with a branch line to Waterville. Navigation by way of the river extends from Wenatchee in Chelan county, to Bridgeport in Douglas county, a distance of 60 miles and at times 40 miles further above Bridgeport. The various roads throughout the entire county are good at all seasons and regular stages (chiefly automobiles) are run between the main points.

The chief local markets are Mansfield, Tonkey, Withrow, Douglas, Waterville, and Alstown, also Wenatchee, Coulee City and Bridgeport.

Resources and Industries: This is naturally an agricultural county. Agricultural enterprises have and always will form the main source of revenue. Besides the wonderful grain fields, fruit culture, stock raising, dairying, and diversified farming are gradually becoming important. Wheat constitutes the main crop, the average annual yield being between one and two million bushels. Oats, barley and corn are cultivated in considerable quantities for ensilage uses. It is the intention in some portions of the county to specialize in stock raising and dairying.

Wages: The general work in this county is agricultural for which $40.00 per month and board is the prevailing scale during farming seasons. There are located in the towns several industrial enterprises such as flouring mills and brick making plants, where men are employed at from twenty-five to fifty cents an hour. Near the Columbia river is a little timber maintaining several saw mills and box factories.

Social Conditions: Churches of all denominations as well as grade and high schools are to be found in the settled communities. Altogether there are 89 school districts. Telegraph and telephone lines extend to almost every point. The annual county fair is held at Waterville during the first week in October.. A general exhibition of farm products and stock is shown.

CITIES, TOWNS AND VILLAGES.

The minor towns or villages, each forming a shipping center for active agricultural, horticultural and stock raising sections are: Beebe, Benita, Bright, Douglas, Columbia River, Delrio, Buckingham, Leahy, St. Andrews, Tonkey, Withrow and Port Columbia. Bridgeport, on the Columbia, and Mansfield and Waterville on the Great Northern maintain municipal organizations. Altogether there are thirty post offices so distributed as to give satisfactory mail service to every part of the county.

Waterville: County seat. Altitude 2,640 feet. Population, 950 in 1910. Present estimate 1,200. Next to Americans, Germans predominate. It is the principal municipality in the county. It is located at the foot of Badger mountain in the heart of one of the richest districts of the Big Bend country and has communication with the rest of the world by the Columbia river five miles to the west, by a branch of the Great Northern railway and by auto stage. One of the seven federal land offices is located here. It has seven churches, a high school, a public library, two weekly newspapers, electric lights, and a telephone system. The county fair is held here from September 30th to October 4th. Fifty foot residence lots may be purchased at prices varying from $25.00 to $100.00, while improved farm lands ten miles away and admirably adapted to agriculture of all kinds may be bought for $25.00 per acre.

Bridgeport: Altitude 927 feet. Population U. S. census, 431. Located in the Columbia river valley about 50 feet above the river's surface. The orchard industry has taken quite a hold and the town is expected to become a fruit shipping center. There is a hundred-barrel cooperative farmers' flouring mill here, also a saw mill, creamery building and a cement block factory. One church, a high school and a weekly newspaper are maintained. Transportation is by steamboat to Wenatchee, daily stage to Mansfield and a ferry across the river.

Mansfield: Estimated population about 300. Is one of the most important wheat shipping stations in the northwest and is located at the terminus of the Waterville branch of the Great Northern railway.

GRANT COUNTY.

This county lies near the central part of the state and is within the territory included in the "Big Bend."

Topography: Like the greater part of eastern Washington in its wild state it is a sage brush region. It is usually undulating or rolling with the main slope toward the south. There are many level plains, coulees and valleys throughout the county. About 25% is level plateau and bottom land, 65% rolling and 10% mountainous. In the eastern part is Moses Lake, the most important body of water in the county. To the north are low hills adapted for grain production. The Grand Coulee separating Grant from Douglas is thought to be the old bed of the Columbia river and presents wonderful natural phenomena as well as opportunities for farming by irrigation.

Population: The 1910 census accords a population of 8,698. As the county was not organized until 1909 no more figures are available for comparative purposes. Many indications, however, point to a steady growth since that enumeration. Native born Americans predominate in the ratio of about two to one of other nationalities.

Lands: The county contains 1,740,800 acres, of which 97,020 acres classified as prairie, farm, and grazing lands are open for entry by application at the Waterville office and 20,400 classified as irrigated, arid and mountainous may be obtained through the North Yakima office. The state owns 85,697 acres, leaving about 1,500,000 in private ownership. About 70% of the county is tillable and the remainder would be suitable for pasture only. Both dry farming and irrigation are practiced. The Quincy irrigation project, a bold scheme for irrigating 435,000 acres of level fertile land lying between the Badger mountains on the north and the Saddle mountains on the south, with water brought from Lake Wenatchee, is within the range of possibility and when accomplished will make this a garden spot of the world.

Soil: Most of the soil is a volcanic ash, varying in places to sandy loam mixed with ash. The heavier, darker soil is in the northern part while it shades into a gray in the central part. The rainfall is greatest in the north, irrigation being more necessary in the remainder of the county. Soil varies in depth from 2 to 20 feet.

Prices of Land: Unimproved dry land without chance of water varies in price from $5.00 to $25.00 per acre. Where water for irrigation is available, the price will run from $75.00 to $250.00. Improved wheat lands range in value from $25.00 to $75.00 per acre. Irrigated lands planted to trees or alfalfa will cost from $150.00 to $400.00, depending on the age of the trees, nature of buildings, size of tract, etc. Cost of placing under cultivation is from $5.00 to $20.00 an acre. There are chances to lease on shares.

Industries and Crops: Wheat constitutes 75% of the total crop and will run close to 3,000,000 bushels annually. Other grains, especially oats, are produced in smaller quantities. Much alfalfa and fruit are raised on the irrigated lands. The chief fruit section is in the Moses Lake region, where an apparently inexhaustible supply of water seems to exist. Most of the apple trees in the county are from one to five years old. Corn has been found to do well and will tend toward the production of more hogs. Large bands of sheep are wintered in the county and ranged on the unimproved lands in springtime. Cattle are raised on the bottom lands and dairying and poultry raising are being promoted.

Water: Excellent water free from alkali is obtained for domestic purposes from springs and wells. Wells are from 40 to 400 feet deep. Besides wells, much water for irrigation is taken from lakes and storage reservoirs. Along the Columbia river at Priest Rapids and Coyote Rapids is immense but unestimated water power. There are large lakes in the county, namely: Moses Lake, in the southern portion; Crab Lake, on the eastern border and Alkali Lake on the northwestern line. Soap Lake and Blue Lake, possessed of wonderful healing qualities, lie directly north of Soap Lake station, which is located on the Great Northern main line.

Transportation: The main lines of the Great Northern and the Chicago, Milwaukee & St. Paul, and the Washington Central branch of the Connell-Northern branch of the Northern Pacific railroads reach all points of importance. This latter also connects

with a branch from Ritzville. The public highways, of which there are many in this county, are generally in good condition. Points located on the Columbia river have steamboat transportation.

Markets: Grant county finds a ready sale for all products at Seattle, Tacoma, and Spokane, where a good market price is always obtained. Wheat brings from 75 to 85 cents a bushel. Hay about $15.00 per ton. The home demand for meat is not supplied.

Wages: Farm labor is paid according to the season, wages ranging about $35.00 to $40.00 a month with board. During the harvest time it runs from $2.50 to $5.00 per day. Plenty of work is obtainable in summer. For unskilled town work the wage is from $1.75 to $3.00 per day, and the skilled from $3.50 to $5.00 a day.

Social Conditions: Churches, school houses and post offices are maintained wherever there are people to benefit from them. Telegraph and telephone lines reach every settled portion of the county. County fairs are held at Ephrata and at Wilson Creek in September of each year. During the summer an interesting horse show takes place at Hartline. There are 29 post offices, 104 school districts and 9 high schools.

CITIES, TOWNS AND VILLAGES.

Coulee City: Altitude about 1,440 feet. Population (U. S. census) 276. Local estimate 500. The oldest town in the county and formerly known as "Grand Coulee Crossing." It is located in grand coulee at the only point where this remarkable geological attraction can be crossed. Numerous fine orchards are located near the town and gardening has been developed quite extensively. About 600,000 bushels of wheat are shipped through this point. It is supplied with three churches, a grade school, a $12,000.00 high school, a newspaper, gravity water system, and all kinds of business houses. It is a freight division point and receives daily passenger and freight service from the Washington Central railroad.

Ephrata: County seat. Altitude 1,272 feet. Population 1910 census, 322. Local estimate 650. Surrounded by wheat, orchard and alfalfa land. Much fruit is just coming into bearing. Land is irrigated from pumping, which is quite successful. It is located on the main line of the Great Northern railroad and is a general supply and shipping point. Wheat shipments amount to about 300,000 bushels annually. The town has four churches, one grade and one high school, telephone and telegraph service, and a weekly newspaper.

Quincy: Altitude 1,300 feet. Population 1910, 264. Local estimate 400. Located on the Columbia plains and the main line of the Great Northern railroad one-hundred-and-forty miles west of Spokane, and six miles from the Columbia river. About 100,000 bushels of wheat are shipped annually. Some stock, poultry, fruit and vegetables are raised. Some irrigation is carried on by pumping. City has three churches, a four-year high school, telegraph and telephone connections, a bank and a weekly newspaper.

Warden: Altitude 1,275 feet. Population (estimated) 250. Is near the southeast corner of the county on the main line of the Chicago, Milwaukee & St. Paul railroad. One hundred miles west of Spokane and about two hundred miles east of Seattle. The Connell Northern branch also runs through the town. It is the principal shipping point for the southern end of the county. Wheat shipment amounts to about 200,000 bushels. The town has two churches, a high school, a waterworks system, telegraph and telephone lines and a weekly newspaper.

Hartline: A small wheat center in the northern part of the county in Paradise Valley. Wheat shipments amount to about 400,000 bushels annually. It has a large flouring mill and grain elevator, two churches and good school facilities. One weekly newspaper is published.

Krupp: Population U. S. census, 293. A wheat shipping center located in the extreme eastern part of the county in Crab Creek Canyon. Wheat shipments amount to about 500,000 bushels annually. A stream of water running through town is never dry. Oats, barley, rye, speltz, root crops, tomatoes, melons, etc., do well here; also fruit raising and dairying. There are several warehouses, one bank, school, church facilities, and a weekly newspaper.

Wilson Creek: Population 1910, 405. A division point on the main line of the Great Northern railway at the confluence of Wilson creek and

Crab creek canyons, 100 miles west of Spokane. About 400,000 bushels of wheat, besides other grain, is marketed at Wilson Creek annually. To see the limitless grain fields one should go just beyond the perpendicular walls that seem to surround the town. It has an electric light plant and a complete system of waterworks, obtaining pure water from an inexhaustible well. Churches, good schools, and one weekly newspaper are maintained.

Soap Lake: Altitude 1,280 feet. Estimated population 250 in winter and 650 in summer. A summer and health resort located on a lake of same name possessed of curative qualities for skin diseases, rheumatism, stomach and kidney troubles, etc. Fruit lands are close by. There are four sanitariums, two salt plants and one factory for Soap Lake products. The Great Northern railway station is just two miles away. There are also interesting geological features near by.

Other trading centers are Beverly, Winchester, Stratford, Adrian, Neppel, Moses Lake, Bend, Lowgap, Ruff, Smyrna, Allouez, Bacon and Trinidad.

FRANKLIN COUNTY.

The county is in the southeastern part of the state, and all parts, excepting the southern, partake more of the nature of the Big Bend country, with which it is grouped in this publication.

Natural Features: At its southernmost point is the confluence of the Columbia and Snake rivers, the Columbia forming a portion of the southern and all of the western boundary and the Snake completing the southern and nearly all of the eastern line. The topography is slightly rolling, rising gradually from the southern to the northern limit by a series of benches. The county assessor estimates about 50% rolling and the rest level. There are also a number of coulees in the county containing much land irrigated by the small streams flowing through.

Population: In 1900 only 486 people were in this county; in 1910 the number had increased to 5,153, showing an increase of 960.3% for the decade. Since 1910 its population has continued to grow. Native born Americans predominate, with Germans, Scandinavians, English and Greeks making up the remainder.

Lands: The total area covers approximately 771,840 acres, of which 37,818 acres are unappropriated and unreserved government lands, described as prairie and grazing and without timber. In addition there are state lands amounting to about 38,365 acres which leaves a balance in private ownership of over 600,000 acres. It is estimated that the total tillable area of the county is 500,000 acres and that the remainder can be profitably utilized for pasturage. All unimproved lands are covered with sagebrush. About 11,000 acres are now under pipe line of the Pasco Reclamation Company.

Soil and Climate: The soil is chiefly volcanic ash ranging in depth from two to forty feet and adaptable to wheat raising, which is the main crop in the northern part of county. In the coulees, where the land is overflowed at certain seasons, alfalfa thrives luxuriantly and four crops are harvested during the year. Land is also well adapted to other cereals as well as vegetables. All that is necessary to make the southern part of the county one of the most productive areas is the carrying out of the Palouse project of irrigation. Where irrigation now obtains, four crops of alfalfa have been harvested in a single year. The rainfall averages an annual precipitation of 15 inches and the winters are very mild and short.

Prices of Land: Prices of lands vary considerably. It is reported that there is a large amount of unimproved land which may be had at from $5.00 to $10.00 an acre, with the cost of putting under cultivation estimated at between $5.00 and $6.00. Improved lands, with good well and farm buildings, is being offered at from $10.00 to $35.00. Near Pasco unimproved irrigable land with water right can be had for $150.00 to $300.00 per acre. An ordinary family would require from 160 to 320 acres of dry farming land and the usual small area of irrigable land. Opportunities exist for leasing improved lands on a basis of about one-fourth of crop in warehouse.

Resources and Industries: It is essentially a wheat growing district and, although other grains, fruit, vegetables, etc., can be raised with some measure of success, thus far wheat has been the staple product. The comple-

tion of the Palouse project, for the survey of which the last legislature made a liberal appropriation, will put 100,000 acres of additional land under water. The U. S. government and the State of Washington are at present arranging for the initial work on this.

Water: The water generally used for domestic purposes is taken from wells. In the coulees water is reached at a depth of from 40 to 100 feet, gasoline engines being used for pumping purposes. The Columbia and Snake rivers could both be made to yield a considerable horse power for industrial uses.

Transportation and Markets: Water transportation is enjoyed on both the Columbia and the Snake rivers. The Spokane, Portland & Seattle, the Northern Pacific, the Connell Northern and the Oregon-Washington Railroad & Navigation railways intersect the county from different angles, bringing all portions within easy reach of railroad transportation. Franklin county wheat as well as its other products, always finds a ready market. The prices are regulated by those offered at Seattle and Tacoma less the cost of freight to those shipping points.

Wages: Farm work commands from $1.00 to $5.00 a day with board, the higher prices being paid during harvest season. Without board $2.00 and upward a day is the rule. Besides plenty of farm labor, there is considerable railroad work in this county, the Northern Pacific shops and round houses being maintained at Pasco and two railroads having terminals at Connell.

Social Conditions: The various communities, although at times far apart, supply themselves with suitable school facilities and churches. Ample wire, rail and postal connections keep them in touch with the leading centers of their own county and of the state. There are 37 school districts and 5 high schools.

CITIES, TOWNS AND VILLAGES.

Only eight towns have post offices. They are: Connell, Eltopia, Kahlotus, Mesa, Page, Pasco, Ringold, and Snake River. The principal of these are Connell and Pasco.

Connell: Altitude 838 feet. Incorporated. Estimated population 500. Nationalities are chiefly Americans, Germans, Scandinavians and Irish. The town is reached by the Northern Pacific, Connell Northern, and Oregon-Washington railways, and has become the central distributing point for the whole northern portion of the county. Improved land in the neighborhood may be bought for $15.00 to $25.00 an acre and unimproved at $5.00 to $10.00 an acre. Wheat and other grains, early vegetables and stock are successfully produced. Hog raising promises to become a very profitable business. Town has three churches, a $15,000.00 brick school house and weekly newspaper. Business buildings are brick and concrete. Two machine shops, in which a "weeder" among other valuable machinery is made, are maintained.

Pasco: County seat. Altitude 370 feet. Population 1900, 254; 1910, 2,083. Increase 803%. Present estimate 4,000. Located in the Columbia river basin at the mouth of the Snake river, it is the chief division point for the Northern Pacific and the Spokane, Portland & Seattle railroads. The Oregon-Washington Railroad & Navigation railroad passes just on the other side of the river. Extensive yards and roundhouse are here, with a large monthly pay roll. The Columbia and Snake rivers furnish steamboat service three ways daily. Other industries include planing mill, ice cream manufacturing establishments, concrete and brick factory, sheet metal and iron works. One of its biggest assets consists in its strategical location for easy and quick transportation at minimum cost. There are seven churches, two grade schools and one high school, public library, one private and two public parks, and two newspapers.

ADAMS COUNTY.

Adams county is usually of a rolling nature like the other counties in the vicinity. About 10% of it is level. The county is broken occasionally by coulees or draws which bring some rock to the surface and at the same time produce some lower land which can be irrigated from springs or lakes. The general slope is toward the south, lying as it does between Lincoln county still higher and Franklin which reaches down to the Columbia river. On the higher crests one can see wheat fields extending almost to the horizon in every direction. Land in its natural state was covered with sage brush.

Population: The census of 1910

enumerates a population of 10,920, showing the ratio of increase between 1900 and 1910 to have been approximately 150%. Very little increase has taken place since. A Russian settlement west of Ritzville is making special success.

Lands: The total area of the county is 1,223,680 acres out of which the United States held on July 1st, 1913, surveyed lands amounting to 18,917 acres, divided as follows in classification: 10,611 acres, prairie, farming and grazing, and 8,306 acres of arid lands valuable for fruit and grain. The state school and granted lands, on September 30th, 1912, amounted to 56,689 acres, thereby showing the balance of land in the county held by private owners to be over 1,000,000 acres. Fully 80% of the county is tillable, while the remainder of 20% is said to be excellent for pasturage.

Soil: The soil in all parts is a volcanic ash, ranging in depth from one to sixty feet and is ideal for the production of grains and for stock raising. Towards the north and east it becomes much heavier. The climate is mild and the rainfall is usually sufficient for successful farming. About 15 inches fall at Ritzville and about 12 at Lind.

Prices of Land: Unimproved land may be purchased at from $8.00 to $15.00 an acre and on easy terms, a small payment down and the balance in yearly installments. Improved lands sell for from $20.00 to $50.00 per acre, the price being governed by the extent of improvements and distance from markets. Close to Ritzville prices for best land run still higher. Opportunities for leasing during a term of years on the basis of one-third of crop to owner may be found. Much land is farmed this way.

Resources and Industries: Rich agricultural land is the main resource although much undeveloped water power exists at the southern edge where flows the Palouse river through Palouse Canyon. The main crop is wheat of which 3,000,000 bushels are produced annually, placing it among the five leading wheat producing counties in the state. Some stock is still raised, while effort is being made to do more dairying and raise more hogs, to which industries the county seems quite adaptable. Near Ritzville a project exists to water several thousand acres from neighboring lakes.

Water: A supply of water for irrigation uses is available along the small rivers and creeks flowing through the county. However, very little irrigation is practiced except for fruit and alfalfa production and in the coulees or canyons. Springs and wells are used for all domestic purposes and an adequate supply of good water can usually be obtained.

Transportation: Railroad transportation is unusually good. The Northern Pacific operates 97 miles, the Chicago, Milwaukee & St. Paul 123 miles, the Spokane, Portland & Seattle 53 miles and the Oregon Railroad & Navigation in the southeastern corner of the county 10 miles, a total of 284 miles of railroad. The big "Central Washington" highway, a primary road now under construction by the state, crosses the county from southwest to northeast. County roads extend in every direction and are usually passable the entire year. There is no trouble disposing of the products, especially wheat, the staple article, which is shipped to the markets of the world.

Wages: The general wages paid are: warehousemen, $3.00 a day; ranch work, $35.00 to $40.00 a month, with board; harvest hands, $2.00 to $3.50 a day, with board. The working season comprises the spring, summer and fall, very little manual labor being found during the winter months, except in flouring mills.

CITIES, TOWNS AND VILLAGES.

Each railroad, with its branches, serves many small centers, every one of which plays its own important part as a shipping or trading point. These may be located from the map. The more important cities and towns are as follows:

Ritzville: County seat. Altitude 1,820 feet. Population 1910, 1,859. Local estimate 2,200. Many Germans and Russians as well as Americans. Formerly most important primary wheat shipping center in the world and still very important in that regard. Located in the midst of a slightly undulating section of beautiful prairie country, rich and fertile and particularly adapted to wheat and potatoes, but produces other cereals well. Good fruit is also raised and diversified farming would be successful. A large flouring mill of 450 barrels per day capacity, runs day and night. There is also an ice manufacturing plant and a creamery is just starting. Bank clearings for 1912 were $3,561,600.00. It has ten churches, one high school, two grade schools, a Carnegie library of 5,-

000 volumes, telephone system, two weekly newspapers (one being in German), city owned water, electric lights, and volunteer fire department. The county fair or wheat carnival is held here. Land in the vicinity may be bought for from $30.00 to $60.00 per acre. An active demand for farm labor usually exists in surrounding country. Some land is just being placed under irrigation.

Lind: Altitude 1,360 feet. Population 1910, 831. Many Russians and Germans besides Americans. The second town in size and importance in the county, located near the geographical center at the junction of two transcontinental railways, the Chicago, Milwaukee & St. Paul and the Northern Pacific. About 400,000 bushels of wheat are shipped annually. There are three churches, a high school, newspaper, flour mill, volunteer fire department, electric lights and good water supply.

Othello: Altitude 1,050 feet. Estimated population 600. Located in the "Pan Handle" on the Chicago, Milwaukee & St. Paul railroad, 192 miles east of Seattle. It is a rapidly growing town and railroad point less than five years old but boasts many business houses, a water system, two churches, good schools, town park, one weekly newspaper and volunteer fire department. A rich wheat country surrounds it and a good local market exists for all produce. Land in vicinity is $10.00 to $20.00 per acre.

Washtucna: Population 1910, 300. Local estimate 400. A rapidly growing town in southern part of county, located on the Oregon Railroad & Navigation and Spokane, Portland & Seattle railroads and surrounded by a wheat country. Many bushels of wheat finds its way to the markets of the world through this point. Many sheep and other live stock are raised in the vicinity, also some fruit. The town has a weekly paper, a high school and two churches.

Hatton: Population 1910, 161. An important wheat shipping town located on the Northern Pacific railway in the southwestern part of the county. City has church and school facilities and a water system. Over 200,000 bushels of wheat are shipped annually.

Cunningham: Altitude 1,139 feet. Estimated population 150. A wheat shipping center located in the south central part of the county, on the Northern Pacific railway, 100 miles southwest of Spokane. An experiment farm of over 500 acres is maintained near this town.

Benge, Schrag, Marcellus and **Keystone** are other important shipping points and trading centers.

LINCOLN COUNTY.

This county is one of the great wheat producing sections of the state, a part of it lying in what is known as the "Big Bend" country.

Topography: The topography is usually rolling with occasional coulees, or canyons, extending in different directions. There is no timber excepting a few small pines at the northern and eastern edges. The general slope is from the ridge along the northern half toward the south. The topography shows 60% rolling, 20% level and 20% hilly.

Population: The United States census reports a population of 17,539 for 1910 as against 11,969 in 1900. 14,779 were native born Americans with Germans, Swedes and Canadians following in the order named. Like all wheat sections the larger part of this population is found in the cities and towns. The farms here are usually among the largest in the state.

Lands: The total area comprises 1,473,280 acres out of which there were held by the United States government (Report of July 1st, 1913) 36,010 acres, classified as farming and grazing lands; the state held (Report of September 30, 1912) 56,449.70 as state school and granted lands, leaving the balance of over 1,300,000 acres in the hands of private owners. Approximately all of Lincoln county is tillable. The very small percentage considered as non-tillable is used for the pasturing of horses and cattle. The climatic conditions are most conducive to crop production. The annual precipitation averages about 17 inches.

Soil: The soil is very fertile. It is of volcanic origin, being decomposed basalt and volcanic ash. Under the microscope each atom resolves itself into a perfect kernel of soil, covered by a moisture-preserving shell, strong and enduring. The depth varies, being greater on the rolling lands and less on the level. The heaviest soil is in the northern half.

Prices of Land: The non-tillable

land, suitable for pasture only, may be purchased at from $3.00 to $10.00 an acre. Improved land, "wheat land," is worth from $20.00 to $60.00 an acre; "meadow land" at from $20.00 to $75.00 and "orchard land" at from $50.00 to $800.00 an acre. Leases may be had on state lands in Lincoln county for $1.50 to $2.20 an acre. Private lands are often leased on a basis of one-third of the crop delivered at warehouse.

Resources and Industries: Wheat raising is the main industry of the farms with flour manufacturing of considerable importance in the leading towns. The annual yield of wheat amounts to about 8,000,000 bushels. The quality of this is claimed by millers to be the best in the Pacific states. There are some orchards by the Columbia river and a few other smaller streams. Some stock raising is carried on while a tendency exists to strengthen the dairying industry which presents good possibilities. Other grains, including oats and barley, are raised to some extent, but are used chiefly for feed. There are some undeveloped mining projects by the river.

Water: There are innumerable small streams, creeks and lakes in every portion of the county besides the Columbia and Spokane rivers on the northern boundary. Very little irrigation is practised except in the orchard lands near the Columbia river and in a few other low places. The water is taken from springs and creeks near by. Water for domestic uses is taken from wells 25 to 200 feet in depth. The supply is inexhaustible and of excellent quality.

Water Power: At the present time the Washington Water Power Company have a power plant in operation on the Spokane river developing an energy of 27,000 horsepower. It is used for the generation of electricity and is distributed throughout the Big Bend country by high tension lines. This is being utilized for lighting and power purposes in the towns and on the farms.

Transportation: The Northern Pacific and the Great Northern cross the county from east to west while the Chicago, Milwaukee & St. Paul, the Oregon-Washington Railroad & Navigation and the Northern Pacific run just across the southeastern corner. A branch line extends from Davenport to Dennys, and another branch is building from Bluestem to Peach and Miles. Regular stages supplement the train service between Davenport and Spokane and connect with the more important centers off the railroad. The public highways are good the year round. The state road known as the Sunset Highway, connecting Seattle with Spokane, runs directly through Lincoln county from west to east, touching at Wilbur, Davenport and Reardan.

Wages: There is very little work to be had in the farming districts aside from the regular farm labor for which the ordinary wage paid, including board, is from $30.00 to $35.00 a month. The work consists of the various details attendant upon wheat production from seed time to hauling to warehouse. At harvest time the regular wage is $2.50 to $4.00 a day; when engineers get $5.00 and separator-men $5.00 to $8.00 a day. Unskilled labor may find employment at the flour mills and warehouses with no fixed scale of wages. Skilled labor, such as carpenters, blacksmiths, etc., are paid from $3.00 to $5.00 a day.

Markets: All of the products of this county find a ready market at a fair price. Wheat, the principal product, being sold chiefly to the local flour manufacturing plants. The other products are shipped to the larger markets through Davenport, Reardan, Wilbur, Almira, Sprague, Harrington and Odessa.

Social Conditions: Nearly all the advantages of city life are enjoyed by actual ranchers whose general prosperity is indicated by the increasing number of automobiles put into use. Free mail delivery, electric lights and telephones are common. Country school facilities are of the best and a deep interest is taken in educational matters. Churches of the leading denominations may be found. There are 137 school districts and 10 high schools.

CITIES, TOWNS AND VILLAGES.

Lincoln county has some twenty-nine established post offices which, with 18 rural free delivery routes distribute mail matter to the remote portions of the county. Most of these may be easily located from the map.

Davenport: County seat. Altitude 2,465 feet. Population 1910, 1,229. Pleasantly situated in the northwest portion of the county 47 miles from Spokane on the C. W. R. R. which traverses the county from east to west. It is an important wheat shipping center, being located in the midst of a

rich wheat producing section with some lands suitable for orchards. It has two banks, eight churches, grade and high schools, two newspapers, volunteer fire department, telephone system, an $80,000.00 court house, numerous social clubs and fraternal orders. The Lincoln county fair is held here each year during the middle of October.

Lincoln: Not incorporated. Formerly called "Miles." Situated in the midst of a rich fruit and grain country at the confluence of the Spokane and Columbia rivers. Immense water power is near and will in time attract manufacturing. Stage connects with Davenport. A railroad is now being built.

Odessa: Altitude 1,560 feet. Population U. S. census 1910, 885. Estimated 900. Mostly American, with some Germans, German-Russians and Bohemians. Located on the main line of the Great Northern railway, 75 miles west of Spokane in the midst of a great farming district, constituting a portion of the famous "Big Bend" country. Besides wheat, corn, fruit and vegetables, hogs and sheep are successfully raised. It is also an important primary wheat shipping market. It has a flouring mill of 400-barrel daily capacity, six churches, grade and high school, newspaper, fraternal organizations, play grounds and driving park, good water system and volunteer fire department. Business buildings are mainly brick.

Sprague: Altitude 1,900 feet. Population 1910, 1,110, American, Irish, German, and Italian. Situated in the southeastern part of the county on the main line of the Northern Pacific railroad, 41 miles west of Spokane. It is an important wheat shipping and flour manufacturing point, and is supplied with all the modern social and business conveniences, including electric lighting, municipal water plant, one bank, grade and high school, private academy, six churches, hospital, newspaper, circulating library, substantial business blocks, and attractive residences. The surrounding country is rolling prairie, some of which is admirably adapted to orchard purposes and all of it to wheat, other cereals, gardening, small fruits and live stock.

Wilbur: Altitude 2,200 feet. Population 1910, 757; local estimate 850. bout midway between Creston and mira on the Washington Central branch of the Northern Pacific railroad in the northern portion of the county. It is of importance as a shipping point and trading center for the wheat industry. There are six churches, a grade and high school, electric lights, municipal water system, a free library, a newspaper, volunteer fire department, a beautiful 160 acre park and a flouring mill of 600 barrel daily capacity. Two fairs are held annually in October.

Long Lake: Altitude 1,400 feet. Construction camp on Spokane river building hydro-electric plant. Will probably develop into a permanent town. Two trains a week and daily stage to Reardan and Spokane are the transportation facilities.

Reardan: Altitude 2,500 feet. Population 1910, 527. Local estimate 600. On the Central Washington railroad, 25 miles from Spokane, in the midst of an agricultural section devoted chiefly to wheat. Auto stages supplement train service. It has a 400 barrel flour mill, electric lights, five churches, one grade school, high school and daily newspaper. An annual mule day is held about the middle of June.

Harrington: Altitude 1,900 feet. Population 1910, 661. Fifty-one miles west of Spokane. Located on the main line of the Great Northern in the midst of a wheat producing section. It has a number of large grain houses and a flouring mill; also electric lights, municipal water system, telephone system, one newspaper and a high school.

Almira: Altitude 1,985 feet. Population 1910, 368. Estimated 450. Situated in the western part of the county on the Washington Central (branch of the Northern Pacific). Wheat and stock raising are principal industries. It is the annual shipping point for many bushels of wheat, some of which, however, comes from Grant county on the west. There are two churches, a grade and high school with a fine library in connection, newspaper, artesian wells, and numerous business enterprises.

Creston: Altitude 2,444 feet. Population 1910, 308. Local estimate 400. Situated about midway between Almira and Davenport, on the Washington Central railroad. The city lies in the center of the "Brent's country," one of the rich farming sections of Lincoln county. Orchard Valley, or the "Peach country," along Hawk creek, contributes to its business activity. It

has a flour mill, one newspaper, five churches, and a high school.

Plum and Peach are important fruit raising centers on the south side of the Columbia river. Transportation is at present by stage and river, but a railroad is now being built to Peach.

Downs, Govan, Waukon, Hellgate, Fishtrap, Egypt, Rocklyn, Miles and Bluestem are other important trading centers.

SPOKANE COUNTY.

Spokane is the second county in population and wealth in the state; the leading county east of the Cascades; and also of a larger area known as the Inland Empire, which includes much of Eastern Washington, Northern Idaho, Northeastern Oregon and Southeastern British Columbia. It lies about midway between the British Columbia line on the north and the Oregon state line on the south.

Topography: Its surface is generally rolling prairie, although rather hilly in the southeast and central west. The central and northwestern portion is rolling timber land with 50 per cent of the timber removed, while the northeastern portion is mountainous and covered with brush and timber. The assessor estimates 85 per cent of the county rolling, 10 per cent mountainous and 5 per cent level. The general altitude, outside of the mountain tops, is from about 2,000 to 2,600 feet. The entire section is studded with beautiful lakes. The famous Spokane river, having its source in Lake Coeur d'Alene, Idaho, flows through the county from east to west, emptying into the Columbia at Lincoln. Many smaller rivers and creeks, the outlets of various lakes in this and neighboring counties, are tributary and afford excellent drainage and untold water power, while hastening to join the Spokane.

Population: In this respect the county ranks second in the state. In 1910 there were 139,404, an increase of 142 per cent over the figures for 1900; 104,402 were living in the city of Spokane. More than 19 per cent, or 26,828, of the whole were foreign-born white, of which 4,944 were Canadians, 2,453 English, 4,150 Germans, 1,309 Irish, 1,772 Italians, 2,279 Norwegians, and 3,990 Swedes. Nearly all other European countries were represented. Indications are that the growth of the past three years has been normal.

Lands: The total area includes 1,123,840 acres of land, of which 31,083 acres are state land and only 514 unreserved government land. In 1910 there were 3,947 farms, containing 361,958 acres of improved land and 320,372 acres unimproved, making the average size of each farm 172.9 acres. At present about 1,000,000 acres are assessable, about 100,000 acres of which are in timber. It is estimated that fully 75 per cent of the entire county is tillable, while the balance is good for pasturage.

Soil: The soil varies in different localities. The southeastern part is a heavy loam, typical of the Palouse country. The northern part is somewhat lighter, of the volcanic ash variety. In the northwest is a sandy loam, while the Spokane valley contains a black gravelly loam underlaid with gravel and well adapted to fruit raising under irrigation. In other parts stock raising is a satisfactory enterprise. Here and there are also peat beds that make splendid meadows.

Climate: A very equable climate is enjoyed in this section, due largely to the prevailing winds from the southwest, which come from off the warm Japan stream in the Pacific ocean. Sudden, violent changes of temperature seldom occur. The precipitation at Spokane city for 1912 was 18.21 inches, including 21.7 inches of snowfall. The death rate was only 8.47 per 1,000. The growing season is about 181 days. Temperature seldom goes above 97 degrees and down to zero about four times in the year. During a period of thirty years there were nine winters without zero weather. The normal temperature reported by the United States Weather Bureau at Spokane for each month of the year is as follows:

January	27 degrees
February	30 degrees
March	39 degrees
April	48 degrees
May	56 degrees
June	63 degrees
July	69 degrees
August	68 degrees
September	59 degrees
October	47 degrees
November	37 degrees
December	31 degrees

Prices of Land: First-class Palouse land in the southern part of county can be bought at from $75.00 to $100.00 an acre, including the usual farm improvements. Very little of this, however, is for sale. Unimproved land in this section is worth from $40.00 to $50.00 an acre. Cost of placing under cultivation is from $3.00 to $5.00 an acre. In the northern and western parts, fringed with light timber, unimproved farm land may be bought as low as $25.00 an acre and grazing land for about $10.00. When nicely improved the price will run as high as $100.00. Irrigated lands, including water rights and improvements, will cost from $250.00 to $600.00. The higher prices contemplate income producing orchards.

Resources and Industries: The principal resources of this county consist of its extensive fertile lands, its timber aggregating about 1,000,000,000 feet, its vast water power, and its suitable locations for commercial and manufacturing enterprises. The mining opportunities in the county itself are meager, but the valuable mining properties of the Coeur d'Alene and British Columbia are tributary and affect the development of the county materially. Millions of dollars are annually taken from these mines and a large part of it goes through the city of Spokane.

The greatest apple section is in the Spokane valley, extending for miles east of Spokane and on into Idaho. This valley is several miles wide and contains about 40,000 acres in Spokane county which produces many carloads of fruit annually. There are altogether about 35,000 acres of land devoted to apple culture and containing upwards of 2,000,000 trees.

Dairying is becoming very important. In the vicinity are a number of the largest commercial dairies in the state, and several world's champion cows are owned by dairymen of this section.

Manufacturing is made easy by the vast water power of the vicinity, which is estimated at about 240,000 horsepower. Much of this is harnessed up by the Washington Water Power Company, which supplies power for all purposes. Most of the present manufacturing is carried on near Spokane city. The total appraised value of all property is $290,661,977.00.

Transportation: The county is literally cut up with railroads and interurban electric lines. Almost every community within its limits has easy access to transcontinental roads. In total railroad mileage it ranks third in the state, having over 479 miles of trackage, representing all the lines that center in Spokane and described with that city.

Excellent highways extend in every direction. In the central part three of the state's primary highways meet. The Sunset crosses from west to east, connecting with what is now known as Apple Way, a wonderful road, extending for many miles in a straight line east from Spokane; the Central Washington leads from the southwest to the center, and the Inland Empire right through the county from the south to the north. These have connections with all secondary and other state and county roads.

Markets: Spokane city is the principal distributing point and supply station for the entire Inland Empire. The transportation facilities for this county, however, are so nearly perfect that the markets for its products might well be designated as "the markets of the world." A fair value is received for the varied productions of the county and no particular difficulty is experienced in disposing of them. Large quantities of dairy, poultry and meat products are shipped in every year to supply the local demand.

Wages: The wages paid for general farm work range from $30.00 to $40.00 a month, with board, or from $2.00 to $3.00 a day without board. Unskilled labor receives from $2.00 to $3.00 and the skilled artisan is paid from $4.50 to $6.00, according to the class of work. During the farming season work is plentiful. Factory work, highway and railroad building, etc., offer other opportunities for laborers.

Social Conditions: The electric interurbans have an effective influence upon the social development of this region, intercourse between the sections being direct and rapid, while Spokane city can be reached in a little over an hour from the most distant parts of the county. Satisfactory telephone, telegraph and mail service are enjoyed. No effort is spared to maintain schools of highest standard, attractive churches and beautiful homes. There are 47 postoffices, 36 rural routes, 162 school districts and 37 high schools in the county.

CITIES, TOWNS AND VILLAGES.

Spokane: County seat. Altitude 1,943 feet. Population 1910, 104,402; 1900, 36,848; increase, 183.3 per cent. United States estimate, July, 1912, 120,994. It is the second city in size and importance in the state and the financial, commercial and industrial center of the "Inland Empire," already described. Its total area is 39¼ square miles, sloping toward the Spokane river on both sides of that stream, which has one of the greatest falls in the world right in the heart of the business district. The north side is chiefly a magnificent plateau connecting with similar country extending for miles northward. On the south are pine-clad hills, with many a magnificent dwelling costing upwards of $100,000 and overlooking the valley below. A parking and boulevard system unsurpassed is outlined. It includes 52 parks, containing 2,056 acres, or an acre for every 58 people. City is backed by the four leading industries of the world, agriculture, lumbering, mining and manufacturing. As many as 215 factories, employing 10,053 persons, with an annual payroll of $8,104,174.00, are maintained. These include two large meat packing plants, twenty sash and door, shingle and box factories; twenty metal working concerns; thirteen brick, clay and cement works; five establishments manufacturing mattresses, shirts and pennants; seven manufacturing paints, carriages and autos; eight making candy, crackers and biscuits; nine bakeries and flour mills, and many others representing nearly every conceivable line of enterprise.

It is one of the most important railroad centers west of the Missouri river. The main lines entering are the Northern Pacific, Great Northern, Chicago, Milwaukee & St. Paul, Spokane, Portland & Seattle and Oregon-Washington Railroad & Navigation Co., while the Chicago, Burlington & Quincy, the Spokane Falls & Northern, the Spokane International and the Chicago & Northwestern enter over tracks of these companies. It is also the hub of an electric interurban system of 213 miles, reaching into Southeastern Washington and Northern Idaho. Within its corporate limits are 157 miles of street car railway and 60 miles of paved streets. A number of the richest mines in the world are tributary and produce millions of dollars annually. The output is expected to increase for years to come. Bank clearings for 1912 were $225,436,034.00, or five times the amount for 1902. There are about 90 churches, representing all denominations, two large high schools with 2,372 students, 33 grade schools and 13 private schools, including Gonzaga College, Spokane College, Spokane University, and a number of commercial schools. School census for 1913 gives 21,517 of school age. The public library has 56,322 volumes. There are four daily newspapers, eight weeklies, two monthlies, two semi-monthlies and one twice-a-week. City maintains a free employment bureau. Drinking water is unsurpassed. Two great fairs are held annually, viz., Spokane Interstate Fair in September, and the National Apple Show in November.

Hillyard: Population 1910, 3,276; local estimate, 3,500. Area about one square mile. Located on the Great Northern railway, five miles from center of Spokane, by which it is almost surrounded. An electric line also connects it with that city. Here are maintained the Great Northern shops, which employ many men and form the mainstay of the city. It has seven churches, high school, three grade schools and one newspaper. Although separately incorporated, it is really a suburb of Spokane and its future growth will undoubtedly depend on the development of that great city.

Cheney: Altitude 2,400 feet. Population, 1910 census, 1,207; local estimate, 1,600. Situated on a gently sloping hillside about 16 miles by rail southwest of Spokane city, with which it is closely connected by an interurban electric, the main lines of the N. P., O.-W. R. & N. and S. P. & S. railways and by the Washington Central branch of the N. P. It is primarily an educational center, one of the three state normals being located here. A new modern building, to cost $300,000, is being constructed. It has a flour mill of 350-barrel capacity, a 2,500 capacity brick yard, a rotary rod and weeder factory, two banks, four churches, a high school, a weekly paper, electric lights, telephone communication, good water and a volunteer fire department. Several exhibit fairs of local interest are held during the year. Country is wooded to the east and south, while north and west is much wheat. Dairying is increasing in importance.

Medical Lake: Altitude 2,392 feet. Population 1910, 1,730 (including in-

mates of state hospital). Local estimate for city limits alone, 900. The town is prettily situated, 12 miles southwest of Spokane, on shores of Medical lake, said to have medicinal qualities for curing rheumatism. Several other attractive lakes are nearby. A granite stone quarry employing 30 men has recently been opened. Just across the lake is located the state's Eastern Hospital for the Insane and the Institution for Feeble-Minded. City has five churches, a high school and volunteer fire department. Water is obtained from state reservoir. The Washington Central branch of the Northern Pacific gives railroad communication and an electric interurban connects with Spokane city.

Deer Park: Population 1910, 875. Local estimate 1,500. Located on the Great Northern Railway 25 miles north of Spokane. Here are the Arcadia orchard tracts, representing probably one of the largest orchards in the world under one management. In the mountains not far away is some mining. Lumbering also is important. City has three churches, a brick high school, two grade schools, a public park, electric lights and weekly newspaper. An agricultural fair is held each year in September.

Rockford: Altitude 2,665 feet. Population 1910, 663. Local estimate 850. On the Oregon-Washington Railroad & Navigation railroad in the southeastern part of county and in a coulee formed at the junction of Rock and Mica creeks. Formerly covered with timber, the region is one of well improved farms, yielding profitable crops of fruit, grain, alfalfa, clover and other grasses. The recent opening of the Coeur d'Alene Indian Reservation is having a healthy influence on its growth. There are six churches, a high school, a public park, weekly newspaper, good water system, electric lights and volunteer fire department.

Spangle: Altitude 2,430 feet. Population, local estimate 450. A pretty town situated at the gateway to the Palouse and offering comfortable homes to retired farmers who own the surrounding lands devoted chiefly to grain production. There are two churches, a high school, electric lights and volunteer fire department.

Fairfield: Altitude 2,539 feet. Population, local estimate 350. An agricultural center on a rolling prairie, 33 miles by the Oregon-Washington Railroad & Navigation railroad south of Spokane and 20 miles west of Lakes Chatcolet and Coeur d'Alene. Fruit and alfalfa do well. There are two churches, a high school, German private school, public library, a park and newspaper.

Meadow Lake: Altitude 2,300 feet. A future fruit raising center on the Northern Pacific railroad, also served by the Washington Water Power Interurban. Fruit is not yet in bearing. Town has church, school and electric lights.

Opportunity: A township organization in the Spokane valley and near the city of Spokane. It contains about 17 square miles of territory and five business settlements or villages. Total population is estimated at 1,500, and taxable valuation at nearly $2,000,000.00. The tracts are usually 5 to 10 acres in size and devoted chiefly to fruit culture, practically all under irrigation. There are five churches, a high school, and five grade schools in the township. All parts have water under pressure and electric lights. Within the township are also a number of manufacturing concerns.

Latah: Altitude 2,490 feet. A farming town with 160 acres within its corporate limits and located on the Oregon-Washington Railroad & Navigation railroad. A rolling prairie surrounds it. A four-year high school is maintained. Lighting is by electricity.

Mead: Altitude 1,700 feet. A fruit and grain farming community of about 300 people. Located on the Great Northern and Spokane Falls & Northern railway. Much development is taking place. Timber cutting and brick making are important industries. It has one church and a two-year high school.

Milan: A farming community on the Great Northern railroad. Lumbering and stock raising are also carried on. A high school is maintained.

Mt. Hope, Deep Creek, Denison, Moab, Buckeye, Chester, Marshall, Nine Mile Falls, Sharon, Spokane, Bridge and Waverly are other important farming centers and distributing points.

WHITMAN COUNTY.

This county borders on the Idaho line and is about equidistant between the northern and southern limits of the state. It contains 2,108 square miles, 58 more than the state of Delaware. The Snake river forms its southern boundary. The Palouse river and its tributaries produce the only valleys of the section and form an excellent natural drainage system. The county is in the heart of what is known as "the Palouse country," and it is the banner county of the state in its production of wheat and animal products.

Topography: The elevation ranges from 700 feet above sea level in the Snake river valley to 2,600 feet in the southeastern part, not including two elevations of 3,300 and 3,700 feet. The country is neither rough nor level but a continuous undulating prairie covered with round-top hills that have rather long gentle southwesterly slopes and more abrupt northerly ones. Toward the east and approaching the Couer d'Alene mountains are some craggy bluffs containing considerable merchantable timber. The river margins have had quite heavy growths of soft woods.

Lands: It is safely estimated that fully 90 per cent. of the entire area is of agricultural value. Of the entire 1,349,120 acres in the county, the census of 1910 shows that 1,187,966 acres, or 88.1 per cent., were contained in 3,096 farms, of which 923,820 acres were improved, making a total average per farm of 383.7 acres with an average improved acreage of 298.4. There remained of unappropriated and unreserved government lands July 1, 1912, 12,867 acres. The state owns about 38,714 acres. Very little land is for sale.

Soil: The soil is fairly uniform all over the county and is chiefly a basaltic loam of fine texture containing considerable organic matter and just sufficient mineral nutrients to make it ideal for the growth of grains, forage, fruit and vegetable crops. The soil extends from the surface to bedrock, often a hundred feet in depth, and is as fertile on the round hilltops as on the plains. It is clear of gravel and rock and yields readily to plow and cultivator.

Population: The census of 1910 gives the county 33,280, that of 1900, 25,360, showing an increase of 31.2 per cent. Seventy-one per cent. were of white native parentage; 18.7 per cent. native born white of foreign or mixed parentage, and 10 per cent. were white foreigners. Of the latter Germans led with 725, of Russians there were 614, Canadians 436, Scandinavians 342, and Britishers 332. The county contains sixteen incorporated towns, within which are 46 per cent. of its total population.

Prices of Land: The value of land depends considerably on its location. From the middle to the western edge unimproved land is held at from $10.00 to $50.00, according to transportation facilities, and improved from $40.00 to $75.00. Eastward, prices will run from $60.00 to $100.00 per acre with occasional pieces close to cities or towns at still higher prices. There is very little unimproved land in the county. The cost of putting land under cultivation is very low, probably not more than from $3.00 to $5.00 per acre. The usual improvements include fencing, windmills, silos and buildings. The tendency in this section is to increase the size of the individual holdings. By more intensive farming, however, much smaller tracts would do for a family. Truck farming, fruit raising and poultry-raising would be profitable on ordinary sized tracts.

Climate: In 1912 the total precipitation at Pullman on the eastern edge was 21.03 inches, including 26.2 inches of snow; at La Crosse in the west 17.22 inches, including 10 inches of snow, and at Rosalia in the north 20.67 inches, including 23.6 inches of snow. At Pullman the annual mean temperature was 46.2 degrees, at La Crosse 48.7 degrees. Sudden or radical changes in temperature seldom occur. The winters are short and the summers long and comfortable.

Transportation: Cheap transportation for crops in the southern part of the county is supplied by navigation on the Snake and Columbia rivers. Two hundred and forty miles of the Oregon-Washington Railroad & Navigation railway radiate throughout the county; 170 miles of the Northern Pacific railway crosses it each way. The Chicago, Milwaukee & St. Paul railway traverses it from east to west and the Spokane, Portland & Seattle railway passes across its northwest corner. In addition, the Spokane & Inland Empire electric railway

reaches all of the principal cities from Spokane and intends to radiate the county westward. One hundred and fifty miles of the state highway have been built and all county roads are gradually being improved with macadam.

Natural Resources: Eighty-five per cent of the entire surface has been proven ideal for grain culture. It is the leading county in this respect, producing 8,000,000 bushels annually. Since this was the easiest and quickest crop to raise and the returns were unusually good, it was natural to engage first in such enterprise, but the same ideal conditions are now known to be equally capable of yielding higher priced crops, viz., fruits, and vegetable products. Conditions for dairying are also splendid. These enterprises together with the raising of stock, sheep, swine and poultry may yet become equally important with grain.

Water: Irrigation is practiced in a limited degree along the Palouse and Snake rivers. Bedrock is from a few feet to 200 feet below the surface and sometimes artesian water is obtained in this, but always surface wells are found in the intervening clay subsoils. The water is usually cool, pure and free from mineral matter in excess. A limited quantity of water power has so far been developed.

Wages: The occupations are generally those pertaining to wheat raising, general farming, stock raising, and fruit harvesting. Wages are $35.00 to $40.00 per month and board. Common farm labor by the day without board is from $1.00 to $3.00. The usual increase takes place during the rush period of the harvest season, skilled operators of harvesting machines getting from $5.00 to $10.00; assistants from $3.00 to $6.00, and laborers from $2.50 to $3.50 per day. In other skilled occupations union wages prevail.

Markets: Sixteen incorporated towns and many other shipping stations located on railroads make the marketing of grain easy. The main market for exporting grain is Tacoma; for milling and brewing grain, Spokane; for dairy products, Spokane and Lewiston, Idaho. Most of the other products are consumed locally.

Social Conditions: Evidences of wealth and a general desire for culture and refinement are everywhere apparent, while a spontaneous feeling of optimism and free hospitality prevails. These conditions have resulted in excellent schools, colleges and church facilities. At Pullman is the State College of Washington, devoted to the teaching of agriculture and science, as well as providing a liberal college course. The experiment station is located here and receives $30,000 a year from the national government for the purpose of conducting experiments in agriculture. There are 173 school districts, 32 high schools, 41 post offices and 38 rural routes.

CITIES AND TOWNS.

Colfax: County seat. Altitude 1,950 feet. Population 1910, 2,783. Local estimate 3,000. One of the oldest settlements of Eastern Washington, 88 miles south of Spokane and central in the county. It is on the Palouse river and the main line of the Oregon-Washington Railroad & Navigation railway, and is also one of the terminals of the Spokane & Inland Empire electric railway. It has four banks, seven churches, three grade schools, one high school, several miles of paved streets and substantial public and business buildings. It publishes two newspapers, is supplied with electric lights and power, and a good water system. Wheat raising, stock farming and dairying are its main supports. It has a sash and door factory, foundry and machine shops, flouring mills and quarries.

Pullman: Altitude 2,340 feet. Population 1910, 2,602. A very pretty city located in the richest section of the Palouse country. It is a home community and one of the chief educational centers of the state, since the State College of Washington is located here. The Oregon-Washington Railroad & Navigation and the Northern Pacific railways, as well as the Spokane electric railway, afford ample transportation. It is the distributing center of a magnificent farming country, yielding wheat, fruit and dairy products. It has a waterworks system, supplying water obtained from artesian sources, a gravity sewer system, electric light and power, nine churches, three banks, an ice plant, flour mill, grist mill, vinegar factory, cigar factory and three newspapers.

Tekoa: Altitude 2,400 feet. Population 1910, 1,694; local estimate 2,200. Located in the extreme northeast corner of county amidst rolling prairies and wheat fields. Two creeks form junction at center of city. This is an

important railway hub of the Chicago, Milwaukee & St. Paul and Oregon-Washington Railroad & Navigation Company railways, which radiate in five directions from the town. It ships much grain, livestock, and some fruit, has several warehouses, a flour mill, a brewery, chop and feed mill, artesian wells, electric lights and paved streets. One newspaper, seven churches, and a high school are maintained. Rich agricultural land in the vicinity may be bought for $75.00 to $100.00 per acre. An agricultural harvest exhibit is held annually.

Palouse: Altitude 2,430. Population 1910, 1,549. One of the important centers of the great inland empire. Situated centrally north and south at the eastern edge of the county on the Palouse river, the Washington, Idaho & Montana railway, the Northern Pacific railway, and the Spokane electric trolley line. The town is picturesquely located, its residence streets rising in terraces from the business district on the river. It is the gateway to the timber regions of Idaho and the trading point for an extensive area. It has two flour mills each with 100-barrel daily capacity, a creamery, steam laundry, wagon and blacksmith shops, one high and two grade schools, seven churches, a newspaper, artesian waterworks, electric lights and volunteer fire department. It holds an annual Harvest Carnival.

Garfield: Altitude 2,470 feet. Population 1910, 932; local estimate, 1,200. Situated in the eastern part of the county and served by two trunk railways, the Oregon-Washington Railroad & Navigation and the Northern Pacific, and by the Spokane & Inland Empire electric system. The town has five churches, a high school and a 13-acre park. Business streets are paved. It maintains municipal waterworks, electric lights, telephone system, newspaper and volunteer fire department. Essentially a farming community, it has of late made certain success of dairying and hog raising.

Rosalia: Altitude 2,200 feet. Population 1910, 767; local estimate, 1,200. On the Spokane & Inland Empire electric railway, and the Lewiston branch of the Northern Pacific at its junction with the Chicago, Milwaukee & St. Paul railways. It is supported by a rich wheat farming section. One of the large dairies of the state is also here. Large quantities of wheat are bought and sold. It supports a newspaper, four churches, a four-year high school and a grade school, also electric lights and a city park. An annual fair and livestock show is held.

Winona: Altitude 1,450 feet. Population (local estimate) 300. A farming village at a junction point of the Oregon-Washington Railroad & Navigation railway near the center of the county. Dairying, wheat, hay and stock raising are important. Fruit culture is carried on very successfully and a specialty is made of poultry. It has a grist mill, a weekly paper, two churches and good school facilities.

Colton: Altitude 2,563 feet. Population 1910, 393. Located in a rich wheat region and on the Genessee branch of the Northern Pacific railway. It has a 300-barrel flouring mill, a machine shop, a newspaper, two churches and an academy for girls, in addition to a four-year high school. It is provided with a municipal water system, electric lights and volunteer fire department.

Farmington: Altitude 2,628 feet. Population 1910, 489; local estimate, 750. At the base of the Coeur d'Alene mountains on the eastern edge of the state, on the Northern Pacific and Oregon-Washington Railroad & Navigation railways. Besides farm enterprises, including dairying, horticulture and cattle raising, it has a number of manufacturing plants, viz., three fruit packing houses, two machine shops, a flour mill, creamery and vinegar works. It is a heavy shipper of grain and operates six grain warehouses. Four churches, a $2,000 high and one grade school, a newspaper, electric lights and city waterworks are maintained.

Malden: Altitude 2,176 feet. Population 1910, 798; local estimate, 1,250. A division point of the Chicago, Milwaukee & St. Paul railway in the northern Palouse country. Monthly payroll from its railway is about $43,000.00. Corn and wheat, the principal crops, grow here without irrigation. General farming and stock raising are also important. The town has water system, electric lights and telephones, high school, grade school and two churches. It maintains a weekly newspaper and holds an annual "Corn Fair."

Oakesdale: Altitude 2,264 feet. Population 1910, 882; local estimate, 1,200. It is a junction point of the Oregon-Washington Railroad & Navigation, Northern Pacific and Spokane Electric railways. Besides being essen-

tially a farming town, it derives considerable support from railroad occupations. It has a carriage factory, a grist mill, five churches, a high school and a newspaper. An agricultural fair is held each year.

Uniontown: Altitude 2,500 feet. Population 1910, 426. A farming town near the state line on the Northern Pacific railway. Chief industry is a brick yard, but of late it has gone into stock and hog raising on a fairly large scale and with success. It is provided with electric lights, telephone, good schools, a church and weekly newspaper.

Albion: Altitude 2,100 feet. Population 1910, 276. A prosperous farming town in the wheat belt and on the Oregon-Washington Railroad & Navigation railway about 14 miles southeast of Colfax. It has a three-year high school, two grade school buildings, a sectarian college and three churches.

Endicott: Altitude 1,726 feet. Population 1910, 474. Present local estimate, 500. Located in a wheat section on the Oregon-Washington Railroad & Navigation railway. Town has four churches, a high school with a 19-acre improved park, a grade school, a private German academy, a free public library, bank, fire department, electric lights and waterworks.

La Crosse: Altitude 1,480 feet. Population (local estimate) 350. On the Oregon-Washington Railroad & Navigation railway in what is known as the dry wheat region, in the western part of the county. It has a weekly paper, three churches, and combined high and grade school. Conditions for stock raising and poultry are good. Three warehouses of 300,000 bushels capacity, and an elevator of 100,000 bushels capacity, are kept busy.

Lamont: Altitude 1,986 feet. Population (local estimate) 350. On the Spokane, Portland & Seattle railway, in the northeastern corner of the county. Supported by a prosperous wheat and stock raising section and provided with ample school and church facilities. It has a weekly newspaper.

St. John: Altitude 1,974 feet. Population 1910, 421; local estimate, 600. A farm town on a branch line of the Oregon-Washington Railroad & Navigation railway, in Pleasant valley. It supports a newspaper, four churches, a grade and a high school. An agricultural harvest carnival is held each fall.

Elberton: A farming town of about 400 people, in the central-eastern section of the county on the Oregon-Washington Railroad & Navigation Co. railway. It has a flour mill, two churches and a high school.

Thornton, Johnson, Penewawa, Wilcox and Belmont are other important trading centers.

SOUTHEAST WASHINGTON.

WALLA WALLA COUNTY.

The Indian name "Walla Walla" which means "Many Waters," adorns a river, a county and a city. The valley of this name comprises all of the southeastern part of the state between the Snake and Columbia rivers on the north and west and the Blue mountains on the south and east and extends on into Oregon. It includes within the State of Washington, the counties of Columbia, Garfield and Walla Walla, and the best of Umatilla county, Oregon. The country is rolling but not hilly, and was originally covered with a heavy growth of bunch grass with some timber along the streams and in the mountains. Topographically the country rises gently from an altitude of 350 feet along the Columbia river on the west, to a height of some 2,000 feet in the Blue mountains on the east. The total area of the county is 1,265 square miles, fifteen square miles larger than the State of Rhode Island, with its population of some 500,000 people.

Population: In 1900 the county had 18,680 people. The 1910 census shows an increase of 70.9% for the decade. Of the total population, 27,442 were native born Americans. Recent estimates show the increase for the last three years to have been proportionately larger than during the ten years from 1900 to 1910.

Lands: The county contains 809,600 acres of land out of which there has been taken for the Wenaha Forest Reserve 3,520 acres; surveyed lands of

the United States, 11097 acres, classified as "grazing and farming lands"; state school and granted lands, 30,516 acres; leaving a balance of over 750,000 acres in the hands of private owners.

The tillable lands are estimated to comprise about 700,000 acres, but the remainder is thoroughly adaptable for splendid pasturage.

Soil and Climate: In the lower valley lands the soil is a rich, deep black loam. It is especially suitable for fruits of all kinds and alfalfa. The upland soil is the famous volcanic ash in which wheat and barley reach their highest degree of perfection. Both dry farming and irrigation are practised with great success and all products are the standards of their kind.

The climatic conditions of Walla Walla county are very propitious for agriculture. The annual precipitation, during thirty years, at the city of Walla Walla, averaged 17.7 inches. Summers are warm and dry, while the winters are of brief duration and with seldom cold enough to supply ice for local use.

Prices of Land: Unimproved land may be bought for $12.00 to $50.00 per acre, and improved for $40.00 to $200. Improvements include state of cultivation and buildings. The cost of putting rough land under cultivation varies from $7.50 per acre for sage brush, to $50.00 for timbered regions. An ordinary family needs from 160 to 320 acres of grain land or the usual small tract for fruit raising. There are opportunities for leasing on a basis of one-third to two-fifths of the crop delivered at warehouse.

Resources and Industries: The chief industries in the order of importance are: general farming, dairying, stock raising, poultry raising, and manufacturing. Sheep contribute materially to the wealth and although the curtailment of free range has reduced the size of the bands, they are still bred in vast numbers, pasturing during the summers in the Blue mountains and wintering in the warm valley. The average wool clip is 8.6 pounds per sheep, compared with 6.1 pounds for the entire United States. This is also one of the leading counties in hog raising, which industry is destined to assume greater importance in the industrial upbuilding of the section.

Its wheat crop is about 5,000,000 bushels annually and about the highest per acre in the state. The main crops produced and their relative importance, taking wheat as a basis are: wheat, 100%; barley, 85%; fruit, 60%, and alfalfa, 25%.

Water: The Columbia, the Snake, the Walla Walla, the Touchet rivers, and innumerable other smaller rivers and creeks supply the county with "many waters." Supplementing the streams are a number of artesian wells in active operation. Irrigation by this method is made highly practicable for land where distance and elevation prohibits the use of river water, while the expense of pumping is eliminated. The probable horsepower of the rivers has never been determined but that it exists, with energy sufficient to supply many manufacturing enterprises, is generally acknowledged.

Transportation and Markets: The county is thoroughly cut up with railroads, including the Northern Pacific, with branches; and the Oregon & Washington circling the county; while every important point not reached by these is made easily accessible by a number of electric lines.

Good county roads are numerous and passable the year round. The Inland Empire highway, a thoroughly first class primary road extending throughout the county from west to east, is now in course of construction by the state.

A ready market for its wheat production is found in the open marts of the world's trade and no difficulty ever exists in its disposal. The fruits, vegetables and other products, after home consumption, find a ready market in northern Idaho and Montana, Spokane, Seattle and Tacoma.

Wages: As this county is essentially a farming country, the principal employment is to be found on the farms and during harvest season. Wages are usually from $30 to $35 per month with board; harvesting from 35 to 50 cents an hour.

Social Conditions: Every religious denomination is amply represented. The county is divided into 67 school districts with property valued at nearly three-quarters of a million dollars. Telegraph and telephone lines form a network about the county; mail facilities are adequate in every detail. Fairs and other exhibitions of the industrial products of the county are held in many places. Live stock and poultry shows of much merit are common in some of the cities and towns. There are 10 high schools, 16 post offices and 12 rural routes.

Daily newspapers are published in

the larger centers and good weeklies in the smaller settlements.

CITIES, TOWNS AND VILLAGES.

There are sixteen postoffices, which enables nearly every inhabitant to receive mail regularly. These offices are Attalia, Burbank, Clyde, College Place, Dixie, Eureka, Lamar, Lowden, Prescott, Slater, Touchet, Two Rivers, Waitsburg, Walker, Walla Walla and Wallula. A few of the larger places are briefly described.

College Place: Altitude 900 feet. Not incorporated. Estimated population 1,900, 80% American born and 20% Germans. It is a suburb of Walla Walla city situated on the Oregon & Washington railroad and the Walla Walla Valley electric line. The village was originally established as an educational center for the Seventh Day Adventists who at present maintain a college and a college normal school here. It has three churches and is plentifully supplied with electric lights.

Prescott: Altitude 1,035 feet. Incorporated. Population 502 (U. S. census). Local estimate 600. Practically all Americans. It is situated on the Oregon & Washington line near the heart of the famous bluestem wheat belt, conceded to be the best milling wheat raised in the Inland Empire. The industries are: farming, horticulture, dairying, stock and hog raising. It also has a large flouring mill. Land can be purchased within a radius of ten miles of the city at from $15 to $80 per acre. This land is best adapted to wheat and other grains, hay and fruit. The city has four churches, grade and high school, a ten-acre park, telephone system, water works and a good weekly newspaper.

Waitsburg: Altitude 1,268 feet. Incorporated. Population, as shown by the U. S. census of 1910, 1,237. Local estimate 1,400. Mostly American born. It is located eighteen miles northeast of Walla Walla on both the Oregon & Washington and the Northern Pacific railways, between the Touchet river and Coppei creek, two mountain streams. The city is surrounded by a very fertile farming country, the principal products of which are wheat and barley. The bottom lands are rapidly being cut up into orchard tracts and commercial apples are fast becoming a staple product.

It has a flouring mill, water power, running the entire year and with a capacity of 600 barrels daily. It enjoys a good water system, electric lights, three churches, a grade and a high school, complete telephone system, two city parks and a weekly newspaper. The annual horse show is held here about the first of May.

Walla Walla: County seat. Altitude 1,060 feet. Population, census of 1910, 19,364; local estimate 20,200; mostly Americans with Germans, Russians, Italians and Chinese following in the order named. Situated in the south central portion of the county on the Oregon & Washington and Northern Pacific railways and on the direct line of the Inland Empire highway, a primary road now in course of construction by the state and which will connect with every portion of the state.

Being surrounded by one of the richest farming districts in the world, its sustaining industries are agriculture, horticulture, stock raising, dairying and manufacturing of farming machinery. It also has several wood working establishments.

Land may be bought within a radius of ten miles at prices ranging from $30 to $300 per acre. Business property may be bought at $200.00 per front foot and 50-foot residence lots at an average of $800.00 each.

The city has seventeen miles of paved streets; fourteen miles of electric railway; a paid fire department; five banks, two of which are among the oldest in the state; sixteen churches; five grade schools; accredited high school; two parks, one of forty acres and the other of ten acres; two metropolitan daily papers and one weekly newspaper.

The water for domestic and city purposes is brought by gravity system from the mountains and is pure, wholesome and abundant. The rainfall for past 24 years has been 17.7 inches. The electric power is generated by water power and is used both for illumination and the furnishing of energy to many manufacturing enterprises.

It is the commercial and financial center for all of southeastern Washington and is the main source of supplies for northeastern Oregon.

The Walla Walla county fair is held here annually in September, the last three days being devoted to a Frontier Days' Celebration. May day festival is held during the latter part of May and an annual poultry show in January. Whitman College is located here.

Wallula: Altitude 322 feet. Population (local estimate) 275. A railroad

and farming center located on the Oregon-Washington Railroad & Navigation Co. and Northern Pacific railroads. Wheat and alfalfa are raised. Dairying has possibilities. Town has a church, good grade school, and one newspaper.

COLUMBIA COUNTY.

Columbia county, nestling between Walla Walla and Garfield counties in the southeastern part of the state, has the navigable Snake river for its northern boundary and the state line on the south. Its total area is 858 square miles, of which the southern portion lies in the Blue mountains and is a part of the Wenaha Forest Reserve. Many small streams originate here and traversing through deep canyons drain the southern part of the county into the Touchet river. The remainder is drained by the Tucannon and its tributaries into the Snake. Fertile valleys are formed by these rivers while on the hills above are broad acres of rich rolling farm land. The population, according to the 1910 census, was 7,042. The citizenship is chiefly American.

Lands: There are altogether 549,120 acres of land in the county, including 161,280 acres in the reserve, 11,197 acres open to homesteading and 16,193 acres of purchasable state land, leaving about 360,000 acres in private ownership. Nearly all of this is in 703 farms and about one-half is improved. One farm alone contains about 30,000 acres. About one-half of the county is tillable and the remainder suitable for pasture. There is considerable logged-off area on the foot hills adjoining the timber.

Soils and Water: The northern part of the county contains some sandy soil and is quite famous for grazing purposes. The central portion contains rich fruit and grain lands. The soil is usually a deep volcanic ash liberally mixed with clay. Very little irrigation is necessary. Climate is healthful and vigorous.

Prices of Land: The prices of unimproved land range from $3.00 to $15.00 per acre with very little to be bought. The improved land is priced at from $20.00 to $500.00 an acre. There are various estimates as to the quantity of land required for a family of five, running from a 5-acre tract up to 2,000 acres, the amount depending entirely upon the crop sought to be produced. The smaller tracts are for fruit, the Touchet valley being one of the richest fruit sections in the state.

Resources and Industries: Raising of stock, fruit and grain constitute chief industries. The grain crop runs to about 3,000,000 bushels, chiefly barley and wheat. In 1912 it was valued at $2,000,000.00. Sheep, beef cattle and hogs are also important products. The heaviest fleece known, weighing 66½ pounds, was sheared from a sheep in this county. Water power is considerable but only slightly developed.

Transportation: The Oregon & Washington and the Northern Pacific railroads traverse the county and furnish excellent outlet for all products. The "Inland Empire" and "Eastern Route of the Inland Empire," both primary state highways, traverse the county from south to north and from west to east. On the northern boundary the Snake river is navigable the full distance.

Markets: The chief markets in the county are Dayton and Starbuck, but the larger portion of the product finds its sale in the markets of the world.

Wages: The wages paid are governed by the kind of work performed and the season in which the labor is done and range from $1.25 to $2.50 per day with board. The work is general farm labor, although some road work and fruit picking (in season) may be had at $2.50 for the unskilled and $4.00 for the skilled worker.

Social Conditions: Churches of all denominations and public schools are found in and near the settled districts. Telegraph and telephone service is well established in every section. The Columbia County Agricultural Fair is held every autumn and the county poultry show takes place in the winter. There are 43 school districts and 7 post offices.

CITIES AND TOWNS.

There are but two cities of any magnitude within its limits, viz., Dayton and Starbuck.

Dayton: County seat. Altitude, 1,620. Population, U. S. census, 2,389. Local estimate 3,500. It is situated very near the geographical center of the county and is the chief point for all exports from the section as well as the dis-

tributor of its merchandise. It is substantially built and is known as the "city of shady walks and pleasant lawns." It has a flour and feed mill of large capacity and mercantile establishments of magnitude and wealth. The religious denominations are well represented by nine churches, while three grade and one high school of recognized merit and standing are provided. It has three newspapers, electric lights, telephone system and volunteer fire department.

Starbuck: Altitude 670 feet. Population, U. S. census, 761. Local estimate 1,000. The city lies along the banks of the Tucannon river in the northern end of the county and is the natural shipping point for the products of that section. It is the junction for two lines of the Oregon & Washington railroad which traverse the county Railroad shops are maintained here, giving employment to a large force of men. Land in the vicinity is quoted all the way from $2.00 to $200.00 per acre according to locality and fertility.

GARFIELD COUNTY.

This is the panhandle shaped county in the southeastern part of the state. It is about fifty miles in length and ranges in width from six miles at the Oregon boundary to thirty miles in the north central.

General topography is similar to counties on either side. The narrow strip is occupied by the Blue mountains and is contained in the Wenaha Forest Reserve. It is heavily timbered and the Pataha river finds its source here. This, with the Deadman creek in the northern part, are the main drainage mediums. About 60% of the county is a rolling plateau rising rapidly from the Snake river, bounding it on the north.

Population: The U. S. census of 1900 records 3,918, that of 1910, 4,199. The population is largely American with Germans and Scandinavians in second and third place, respectively. The majority are in the valley of the Pataha.

Lands: The total land area is 444,160 acres, out of which there are held in the Wenaha Forest Reserve some 99,200 acres; in addition to which the government holds as "unappropriated and unreserved" (July 1st, 1913) some 8,362 acres, while the state school land (September 30th, 1912) amounted to 14,274 acres, leaving over 300,000 acres in the hands of private owners. It is estimated that there are 163,790 acres of tillable lands in Garfield county and that the remainder outside of forest reserves could be used advantageously for grazing purposes. The average rainfall is from 16 to 20 inches. There are no extremes of temperature and the weather is nearly always suitable for outdoor work of any nature.

Soil and Crops: Mostly volcanic ash and deep loam. Best adapted to grain raising. In the irrigated bottoms alfalfa and fruits are grown extensively, while on the higher and main plateau wheat, barley, oats and timothy are the principal products.

Prices of Land: Very little of the unimproved land is tillable. It is held at from $10 to $20 an acre with plenty for sale. The improved, or grain land, is offered at from $25 to $80 with considerable on the market. The price of the improved land is governed by location and state of improvements. Of the irrigable fruit lands, ten acres is plenty for a family. Opportunities exist for leasing both on shares and on a cash basis.

Resources and Industries: Besides the rich farm lands, this county has about 300,000,000 feet of timber in the reserve destined in time to yield big returns. The annual grain crop is about 2,000,000 bushels. This is supplemented with cattle, hogs, horses and poultry. Along the Snake river much fine fruit is produced.

Water: Water for all purposes is obtainable from the mountain streams and from wells. The quality is generally good. There is water power taken from the Pataha creek and utilized in the running of two flouring mills, each with a capacity of about sixty barrels per day. Other water power could be obtained from the upper Tucannon river in the government reserve, but is not now available.

Transportation and Markets: Daily steamboat service is enjoyed by all settlements located on the Snake river. On the north side the Camas Prairie railroad skirts the county, while daily trains run on the Oregon & Washington branch line from Starbuck in Columbia county to Pomeroy. Public highways are numerous and generally good. Most of the grain is shipped through Pomeroy. Prices for wheat range from 60 to 90 cents; cattle, 5 to

7½ cents per pound; hogs, 6 to 9 cents per pound.

Wages: Very little labor other than farm work is needed in Garfield county. The ruling wage for this is $30 to $40 per month ordinarily, and from $3 to $3.50 per day during harvest. These wages include board. Some work at carpentering, painting and like employment may be found in the settled districts at about $4 a day. Unskilled labor receives $1.50 to $3 a day.

Social Conditions: School houses and churches are within easy reach of all. The residences are made homelike, while spacious barns and up-to-date farm machinery betoken general prosperity. The rural mail delivery and telegraph and telephone service are also factors in the general welfare of this community. There are 5 post offices and 36 school districts in the county.

CITIES, TOWNS AND VILLAGES.

Pomeroy: County seat. Altitude 1,900 feet. Population 1910, 1,605. Local estimate 1,800. Principally German and Irish descent. It is the terminal of a branch line of the O.-W. R. & N. railroad, the center of the grain belt and principal city in the county. Auto stages connect with Dayton and with Lewiston, Idaho. It is supported by farming and stock raising industries and serves as the main shipping center for the county. Opportunities exist for the establishment of a dairy. Yearly payroll is about $175,000. It has municipal water works, electric lights, and paid fire department. Seven churches, a high school and grade school, and two private schools, contribute to the general welfare. The city also has a public park and two newspapers. County fair is held here.

Other centers are Ilia, May View, Peola, Unfried, Pataha City, Gould City, Valentine, Chard, Zumwalt, Ping and Alpowa.

ASOTIN COUNTY.

This is one of the smaller counties and located in the extreme southeastern part of the state. It slopes from the Blue mountains in the southwest toward the navigable Snake river bounding it on the east and north. It is abundantly supplied with small streams forming many fertile valleys. About 50% of its surface is rolling and mountainous and the other 50% nearly level, consisting of plateaus, bottom lands, and bench lands.

Population: Its population in 1910 was 5,853. In 1900 it was only 3,336. People are chiefly Americans, with Germans, Scandinavians and English ranking next.

Lands: Asotin county contains 387,840 acres of land, of which 54,400 acres are held in the Wenaha Forest Reserve; 23,338 acres are included in the state lands, and 64,984 acres are open to homesteading. This would leave in the hands of private owners, about 244,000 acres, well adapted to general farming, fruit and early vegetable raising, live stock and poultry culture.

Soil: The soil is of a diversified character. It is from two to ten feet deep; lower benches consist of volcanic ash, higher altitudes consist of varying light to heavy loam. Uplands are best suited to the production of wheat, barley, oats and timothy. In the valleys irrigation is practiced and fruit, truck and alfalfa assume the highest degree of perfection. Two full crops of strawberries and as many as three crops of potatoes have been known to mature near Asotin, the county seat.

Prices of Land: The prices of unimproved lands range from $10.00 to $40.00 per acre. Improved lands may be had within a radius of from two to ten miles of incorporated municipalities for from $50.00 to $75.00 an acre; partially improved "homestead relinquishments" 25 to 50 miles distant from Clarkston at from $10.00 to $40.00. The choicest fruit lands, with perpetual water rights, are sold at from $300.00 to $400.00 an acre.

Resources and Industries. The natural resources are the magnificient timber belts, the underlying immense bodies of coal and the agricultural lands. The leading crop is wheat. Stock and poultry raising, dairying, fruit growing, diversified farming and truck gardening are also important industries that have proven profitable. About 3,000 horse power is generated in Asotin creek and 3,000 acres are irrigated. Grande Ronde river has unlimited undeveloped power. Capacity of lumber mills is about 2,000,000 feet.

Water: The navigable Snake river on the northern and eastern boundaries; the Grande Ronde river and Joseph creek running through the southern portion; Asotin creek ar

many tributaries, with sources in the Blue mountains, flowing through the central part; and Alpowa creek in the north end of the county, furnish abundance of water for all purposes.

Transportation: There are no railroads in this county. The Camas Prairie railroad, however, from Lewiston Junction in Whitman county to Lewiston, Idaho; the Northern Pacific and the Oregon-Washington Railroad & Navigation Company are just across the county and give rail advantages. A large steel suspension bridge connects Clarkston with Lewiston, Idaho. The Snake river is navigable from its mouth for a considerable distance beyond Asotin county. The "Eastern Route" of the "Inland Empire" highway, a primary road under construction by the state, crosses the northern part of the county.

Markets: Local packing and commission houses at Asotin, Clarkston, and Lewiston, Idaho, handle most of the products. Most of the fruit is shipped to the large mining towns of Montana, to the Dakotas, Minnesota, British Columbia and Manitoba, where good prices are always obtained. Much wheat is shipped over sea via the river route.

Wages: Carpenters $3.50 to $4.50 a day; masons and plasterers $4.00 to $5.00 a day; laborers $2.00 to $2.50 a day; farm hands $25.00 to $40.00 a month and board; harvest hands $3.00 to $5.00 per day and board. Women and girls, during the season, make about $10.00 a week picking and packing fruit.

Social Conditions: Asotin county is possessed of all the usual comforts and conveniences. Churches of nearly all denomination and schools both high and grade are generally to be found. Fraternal societies are well represented. Telegraph and telephone communication is ample. There are 27 school districts, 3 high schools and 10 post offices.

CITIES, TOWNS AND VILLAGES.

Asotin: County seat. Altitude 760 feet. Population, 1910 census, 820; local estimate 1,450. The farms, orchards and vineyards tributary are famous for their large and excellent productions. It has an electric plant, flour mill of 100 barrels per day capacity, a large grain warehouse and a cement plant. Four church denominations are represented. It has one high and two grade schools, weekly newspaper, municipal water system, electric lights and volunteer fire department.

Clarkston: Altitude 825 feet. Population 1910, 1,257. Local estimate 1,500. It boasts the justly celebrated "Vineland" district where irrigation is rapidly making of that valley one of the wonder spots on the American continent. Clarkston is so closely allied with Lewiston, Idaho, on account of the big steel suspension bridge connecting the two municipalities that the interest of the two are almost identical. The Northern Pacific and O.-W. R. & N. railroads are less than a mile away. It is an important shipping center for the products of a large and growing territory rich in possibilities for fruit culture, grain and stock raising. It has a box factory, sash and door factory, two lumber yards, electric plant, canneries and fruit packing houses. It has one weekly and one daily newspaper, nine churches, three grade schools, a high school, telephone system, public library, electric lights, and paid fire department.

Cloverland: Altitude 2,250 feet. Estimated population 100. In the midst of a rich farming district, mostly in orchards and under irrigation. Tracts are five to ten acres. A daily stage connects it with Asotin 15 miles away.

Anatone: With an estimated population of 250 people is another farming town near the center of the county. It has a church, high school, public library, a park, one mile of paved street and a volunteer fire department.

Other centers are Craige, Jerry, Silcott, Theon and Zindel.

A Few Important Facts Showing Washington's Superiority.

THE STATE OF WASHINGTON

Increased in population during decade from 1900 to 1910 at a higher rate than any other state in the Union.

Has a larger body of standing timber than any other state except Oregon.

Leads all states in the annual production of lumber.

Produces two-thirds of all the shingles manufactured in the United States.

Gained in total value of manufactures during a ten year period at a higher rate than any other state, whose manufactures amounted to more than $18,000.00 in 1899.

Has the lowest death rate of all registration states.

Ranks first of 48 states, educationally, according to statistics compiled by the Russell Sage Foundation.

Has the smallest number of illiterates per thousand of native born whites 21 years of age and over (according to the 1910 census).

Has two cities ranking first and third in least illiteracy of all municipalities with 100,000 population and over.

Produces more wool to a fleece than any other state in the Union.

Stands first in the yield of oats per acre.

Produces more hops per acre than any other state.

Gets the highest prices for apples in foreign markets.

Stands third in the Union in total annual production of plums and prunes.

Contains land that broke the world's record in the production of wheat per acre.

Has produced a number of world record dairy cows.

Stands third in Union in amount of developed water power and ranks not lower than third in quantity still undeveloped.

Was the first state to provide compulsory industrial insurance for its injured workmen.

Is an empire within itself, and can produce everything necessary for human happiness.

For further information address the various Commercial Organizations, or write direct to

THE STATE BUREAU OF STATISTICS AND IMMIGRATION,
OLYMPIA, WASHINGTON.

ABSTRACT OF ALL TAXABLE PROPERTY BY COUNTIES FOR THE YEAR 1913

SHOWING ACTUAL VALUE, ASSESSED VALUE, AND RATIO OF ASSESSED TO ACTUAL VALUE.

(From Report of State Board of Equalization.)

	COUNTIES	Actual value of all taxable property exclusive of public utilities	Actual value of public utilities	Actual value of all taxable property	Ratio of assessed value to actual	Assessed value of real property including improvements (except railw'ys and telegraph lines)	Assessed value of taxable personal property	Assessed value of public utilities	Assessed value of all taxable property	
1	Adams	$35,060,372	$19,661,096	$54,721,468	41.16	$12,778,871	$1,651,978	$8,092,507	$22,523,356	1
2	Asotin	11,323,651	.....	11,323,651	36.45	3,428,856	698,615	.....	4,127,471	2
3	Benton	23,402,408	14,305,311	37,707,714	37.45	8,189,920	624,280	5,357,339	14,121,539	3
4	Chehalis	77,371,563	8,035,866	85,407,429	40.23	26,556,049	4,570,582	3,232,828	34,359,409	4
5	Chelan	34,550,706	7,779,603	42,330,309	35.98	11,126,249	1,287,820	2,795,211	15,209,280	5
6	Clallam	23,416,906	162,168	23,579,074	52.76	11,889,205	465,555	85,559	12,440,319	6
7	Clarke	38,360,748	6,703,283	45,064,031	30.75	9,826,150	1,969,800	2,061,259	13,857,189	7
8	Columbia	16,342,643	4,506,719	20,849,362	41.31	5,731,190	1,019,956	1,861,725	8,612,871	8
9	Cowlitz	25,725,141	5,914,217	31,639,358	29.12	6,689,631	801,590	1,722,219	9,213,380	9
10	Douglas	21,291,420	3,686,067	24,977,487	39.02	7,508,947	798,965	1,438,308	9,746,215	10
11	Ferry	4,518,023	2,543,169	7,061,192	45.18	1,471,808	569,435	1,149,008	3,190,246	11
12	Franklin	16,106,296	14,774,288	30,879,584	28.00	3,876,051	632,432	4,136,800	8,646,283	12
13	Garfield	11,672,535	746,983	12,419,518	36.01	3,576,210	627,070	268,988	4,472,268	13
14	Grant	27,872,298	13,469,323	41,341,621	35.60	9,085,918	836,620	4,795,077	14,717,615	14
15	Island	3,603,958	.....	3,603,958	46.18	1,442,708	221,600	.....	1,664,308	15
16	Jefferson	16,407,982	970,759	17,378,741	39.35	5,855,862	600,679	881,996	6,838,534	16
17	King	502,651,059	56,972,822	559,623,881	46.82	204,101,500	31,239,726	26,674,672	262,015,898	17
18	Kitsap	15,796,329	23,216	15,819,545	36.40	5,033,860	716,004	8,450	5,758,314	18
19	Kittitas	32,720,909	17,563,637	50,284,546	33.09	8,991,089	1,886,260	5,811,807	16,689,156	19
20	Klickitat	24,097,804	11,643,790	35,741,594	30.29	6,389,740	909,485	3,526,903	10,826,128	20
21	Lewis	46,039,981	7,107,926	53,147,907	38.11	15,367,478	2,178,359	2,708,580	20,254,667	21
22	Lincoln	49,751,432	12,216,958	61,968,390	39.02	16,746,396	2,666,622	4,767,056	24,180,065	22
23	Mason	13,575,206	549,650	14,124,850	44.27	5,557,548	452,196	243,329	6,253,073	23
24	Okanogan	15,375,212	1,645,954	17,021,166	42.61	5,349,683	1,201,695	701,841	7,252,719	24
25	Pacific	34,714,492	1,903,983	36,618,475	49.02	14,955,098	2,061,951	963,332	17,980,376	25
26	Pend Oreille	11,014,461	5,244,983	16,259,394	40.01	3,615,380	791,306	2,098,496	6,505,382	26
27	Pierce	195,923,888	19,605,874	215,529,262	51.38	82,678,891	17,986,808	10,073,289	110,738,988	27
28	San Juan	4,027,823	.....	4,027,823	36.62	1,092,912	282,077	.....	1,474,989	28
29	Skagit	37,206,506	9,168,648	46,374,154	31.02	9,641,325	1,809,823	2,844,114	14,295,262	29
30	Skamania	7,016,803	4,635,735	11,652,538	42.73	2,798,185	205,095	1,960,849	4,979,129	30
31	Snohomish	76,898,101	22,666,091	99,559,192	39.50	24,710,435	5,662,340	8,953,103	39,325,878	31
32	Spokane	253,850,571	36,811,406	290,661,977	42.16	91,330,366	15,693,065	15,519,687	122,543,068	32
33	Stevens	23,463,987	4,078,200	27,542,187	33.43	6,227,108	1,028,635	1,965,881	9,221,124	33
34	Thurston	25,599,242	7,400,076	32,999,318	43.43	9,267,848	1,849,908	3,213,850	14,331,601	34
35	Wahkiakum	5,168,146	.....	5,168,146	40.14	1,717,170	357,324	.....	2,074,494	35
36	Walla Walla	60,051,160	15,101,099	75,152,259	41.64	21,146,391	3,858,912	6,288,097	31,293,400	36
37	Whatcom	68,288,506	10,946,175	69,234,681	37.15	17,944,209	3,709,971	4,066,502	25,720,682	37
38	Whitman	70,007,369	31,792,482	102,399,851	40.36	24,428,990	4,068,144	12,831,443	41,328,577	38
39	Yakima	70,888,053	10,151,715	81,039,768	44.06	27,594,995	3,617,015	4,469,799	35,681,809	39
		$2,021,746,685	$390,485,722	$2,412,235,407	42.44	$735,005,387	$122,350,549	$156,489,091	$1,014,475,027	

TABLE SHOWING MILEAGE AND VALUE OF STEAM AND ELECTRIC RAILROADS, WIRE MILEAGE AND VALUE OF TELEGRAPH LINES, AS SHOWN IN THE 1913 REPORT OF THE STATE BOARD OF TAX COMMISSIONERS; ALSO MILES OF IMPROVED AND UNIMPROVED HIGHWAYS AS SHOWN IN THE 1912 REPORT OF THE STATE HIGHWAY COMMISSIONER.

	COUNTIES	Miles of main track and fractions	Miles of sidings and fractions	Total mileage and fractions	Actual value of real property	Actual value of personal property	Total actual value of railway property	Electric Railroads		Highways. Total mileage	Telegraph Lines		
								Mileage	Actual value		Wire mileage	Actual value	
1	Adams	232.331	51.179	283.510	$17,487,349	$2,178,629	$19,615,978	.....	.....	2,455.	650.68	$45,118	1
2	Asotin	.....	.....	.....	.....	.....	.....	.....	.....	317.	.....	.....	2
3	Benton	156.996	33.187	190.183	13,114,197	1,171,661	14,285,858	.....	.....	857.	259.20	19,453	3
4	Chehalis	155.543	44.129	199.672	6,004,126	1,051,347	7,055,473	13.587	$997,645	567.	169.86	12,748	4
5	Chelan	82.759	33.786	116.545	6,944,833	813,174	7,758,007	.....	.....	634.1	287.75	21,596	5
6	Clallam	18.773	2.417	21.190	107,657	45,900	153,557	.....	.....	191.	129.00	8,611	6
7	Clarke	84.643	30.541	115.189	5,617,847	901,916	6,519,763	14.163	183,310	2,100.	2.80	210	7
8	Columbia	74.643	14.286	88.929	4,205,872	286,678	4,492,550	.....	.....	521.5	188.79	14,169	8
9	Cowlitz	80.249	7.886	88.135	4,478,621	1,400,281	5,878,902	.....	.....	600.	509.83	35,315	9
10	Douglas	80.724	9.811	90.535	3,317,731	362,728	3,680,459	.....	.....	1,955.7	74.72	5,606	10
11	Ferry	104.979	21.326	126.305	2,298,070	250,099	2,543,169	.....	.....	550.	.....	.....	11
12	Franklin	174.124	54.676	228.800	13,311,672	1,431,338	14,743,010	.....	.....	814.2	416.76	31,278	12
13	Garfield	16.050	1.980	17.980	704,772	40,973	745,745	.....	.....	501.	16.50	1,238	13
14	Grant	212.539	31.138	243.677	11,846,216	1,596,956	13,443,171	.....	.....	1,900.5	391.68	26,152	14
15	Island	.....	.....	.....	.....	.....	.....	.....	.....	198.7	.....	.....	15
16	Jefferson	26.400	1.268	27.668	802,063	160,609	962,672	.....	.....	244.	123.25	8,087	16
17	King	479.700	299.360	779.060	31,621,425	5,380,677	37,002,102	251.264	19,557,826	1,746.	1,634.44	112,894	17
18	Kitsap	.....	0.254	0.254	14,484	3,588	18,072	.....	.....	485.	75.00	5,144	18
19	Kittitas	169.951	88.164	258.115	15,079,698	2,438,535	17,518,228	.....	.....	602.	747.20	50,409	19
20	Klickitat	135.214	31.196	166.410	11,154,211	489,579	11,643,790	.....	.....	1,615.6	.....	.....	20
21	Lewis	132.851	29.535	162.386	5,450,687	1,347,518	6,798,205	6.015	275,000	1,147.8	508.30	34,721	21
22	Lincoln	166.908	25.670	192.478	10,651,524	1,529,088	12,180,612	.....	.....	2,823.	496.04	36,346	22
23	Mason	42.908	14.330	57.238	392,320	157,330	549,650	.....	.....	369.	.....	.....	23
24	Okanogan	48.430	9.787	58.217	1,482,449	163,505	1,645,954	.....	.....	732.	.....	.....	24
25	Pacific	68.642	11.573	80.215	1,521,592	301,500	1,823,092	5.251	76,200	253.5	62.50	4,691	25
26	Pend Oreille	85.540	19.520	105.060	4,621,764	616,490	5,238,254	.....	.....	200.	89.00	6,679	26
27	Pierce	222.337	181.806	404.143	11,885,256	2,516,578	14,401,834	142.570	5,144,612	906.7	838.23	58,928	27
28	San Juan	.....	.....	.....	.....	.....	.....	.....	.....	197.	.....	.....	28
29	Skagit	130.716	49.313	180.029	7,386,400	1,072,687	8,459,087	24.192	680,526	685.	413.80	29,085	29
30	Skamania	40.577	7.249	47.826	4,461,410	174,325	4,635,735	.....	.....	131.	.....	.....	30
31	Snohomish	296.398	101.617	397.010	17,196,911	2,560,623	19,757,534	88.890	2,864,715	1,214.	620.19	43,842	31
32	Spokane	321.470	157.997	479.467	23,733,501	2,789,598	26,523,099	278.296	10,206,000	2,962.8	1,187.22	82,307	32
33	Stevens	121.306	20.318	141.624	3,673,084	405,116	4,078,200	.....	.....	1,420.	.....	.....	33
34	Thurston	150.748	42.986	193.734	5,770,271	1,315,173	7,085,444	5.988	231,330	400.	477.13	33,302	34
35	Wahkiakum	.....	.....	.....	.....	.....	.....	.....	.....	65.	.....	.....	35
36	Walla Walla	270.452	40.058	310.510	13,314,887	1,349,846	14,663,733	20.000	395,867	1,012.	552.95	41,499	36
37	Whatcom	132.998	45.954	178.947	7,711,341	1,234,688	8,945,979	34.518	1,980,271	1,149.	302.65	19,925	37
38	Whitman	428.683	75.424	504.107	25,602,983	2,322,259	27,925,192	33.644	3,794,000	2,518.2	976.55	73,290	38
39	Yakima	159.413	55.114	214.527	8,461,195	1,302,798	9,763,993	30.313	362,207	2,013.75	339.98	25,515	39
	Totals	5,101.498	1,648.172	6,749.670	$301,372,863	$41,158,240	$342,531,103	978.691	$47,069,509	39,062.05	12,486.45	$888,110	

LIST OF COUNTIES, CITIES AND INCORPORATED TOWNS AND THEIR POPULATION AS GIVEN BY THE CENSUS REPORT OF 1910; ALSO THE NAMES OF ALL COMMERCIAL ORGANIZATIONS REPORTED FOR 1913 IN BOTH INCORPORATED AND UNINCORPORATED COMMUNITIES; ARRANGED ACCORDING TO COUNTIES.

The organizations listed will gladly send further information whenever requested, regarding their respective communities. Sample of address: Commercial Club, Othello, Washington.

The * indicates county seat, the dagger † means unincorporated. Population figures in parenthesis ( ) are local estimates. Where no population figures are given no estimates were received. No commercial body was reported unless specifically mentioned after name of each municipality.

Population for entire state..... 1,141,990

	Population
ADAMS COUNTY	10,920
Cunningham, City Council	153
Hatton	161
Lind	831
Othello, Commercial Club	(600)
*Ritzville, Commercial Club	1,859
Washtucna	300
ASOTIN COUNTY	5,831
*Asotin, Commercial Club	820
Clarkston, Chamber of Commerce	1,257
BENTON COUNTY	7,937
†Hanford, Commercial Club	(200)
Kennewick, Commercial Club	1,219
*Prosser, Commercial Club	1,298
Richland, Commercial Club	(800)
†White Bluffs, Commercial Club	(500)
CHEHALIS COUNTY	35,590
Aberdeen, Chamber of Commerce	13,660
Cosmopolis, Chamber of Commerce	1,132
Elma, Commercial Club	1,532
Hoquiam	8,171
Commercial Club.	
Grays Harbor Development Club.	
*Montesano, Chamber of Commerce	2,488
Oakville, Development Association	465
Ocosta	127
†Quinaiult, Improvement Club	
†Westport, Commercial Club	(250)
CHELAN COUNTY	15,104
Cashmere, Commercial Club	625
Chelan, Commercial Club	682
†Chelan Falls, Commercial Club	(44)
Lakeside	222
Leavenworth, Commercial Club	1,551
†Maplecreek, Commercial Club	(100)
*Wenatchee, Commercial Club	4,050
CLALLAM COUNTY	6,755
*Port Angeles, Commercial Club	2,286
Sequim, Commercial Club	(400)
CLARKE COUNTY	26,115
Camas, Commercial Club	1,125
La Center, Commercial Club	(400)
Ridgefield, Commercial Club	(500)
*Vancouver, Commercial Club	9,300
Washougal, Commercial Club	456
Yacolt	435
COLUMBIA COUNTY	7,042
*Dayton, Commercial Club	2,389
Starbuck	761
COWLITZ COUNTY	12,561
Castle Rock, Booster Club	998
*Kalama, Commercial Club	816
Kelso, Commercial Club	2,039
Woodland, Commercial Club	384
DOUGLAS COUNTY	9,227
Bridgeport, Commercial Club	431
Mansfield	(350)
*Waterville, Commercial Club	950
FERRY COUNTY	4,800
†Orient, Improvement Club	(200)
*Republic, Commercial Club	999
FRANKLIN COUNTY	5,153
Connell, Commercial Club	(500)
Kahlotus	132
*Pasco, Chamber of Commerce	2,083
GARFIELD COUNTY	4,199
Pataha	176
*Pomeroy, Commercial Club	1,605
GRANT COUNTY	8,698
†Beverly, Commercial Club	
Coulee City, Commercial Club	276
*Ephrata, Commercial Club	323
Hartline	237
Krupp, Commercial Club	(130)
Quincy, Commercial Club	264
†Soap Lake, Commercial Club	(250)
†Trinidad, Commercial Club	(40)
Warden, Commercial Club	(250)
Wilson Creek, Commercial Club	405
ISLAND COUNTY	4,704
*Coupeville, Commercial Club	310
Langley, Commercial Club	(350)
†Oak Harbor, Commercial Club	500
JEFFERSON COUNTY	8,337
†Irondale, Chamber of Commerce	(300)
*Port Townsend, Commercial Club	4,181
†Quilcene, Commercial Club	(750)
KING COUNTY	284,638
†Algona	
Auburn, Business Men's Club	957
Bothell, Commercial Club	599
†Cove, Improvement Club	(125)
†Des Moines, Commercial Club	(500)
Duvall, Commercial Club	(550)
Enumclaw, Commercial Club	(1,200)
Issaquah, Commercial Club	625
Kent, Commercial Social Club	1,908
†Kennydale, Citizens Association	(600)
Kirkland, Chamber of Commerce, East Side Commercial Club	532
Northbend, Commercial Club	299
Pacific	413
†Portage, Vashon Island Commercial Club	(56)
Ravensdale	(325)
Redmond	(350)
Renton, Chamber of Commerce	2,740
†Richmond Beach, Improvem't Club	(600)
*Seattle	237,194
The New Chamber of Commerce.	
Commercial Club.	
Rainier Valley Commercial Club.	
Women's Commercial Club.	
Salmon Bay Improvement Club.	
Skykomish	238
Snoqualmie	279
Tolt, Commercial Club	(500)
Tukwila, Women's Improvement Club	361
KITSAP COUNTY	17,647
Bremerton, Commercial Club	2,993
†Brownsville, Improvement Club	(250)
†Burley, Improvement Club	(125)
Charleston, Commercial Club	1,062
†Manette, Improvement Ass'n	(600)
*Port Orchard, Commercial Club	682
Poulsbo	364
†Rollingbay, Progressive Club	(400)
KITTITAS COUNTY	18,561
Cle Elum, Commercial Club	2,749
*Ellensburg, Chamber of Commerce	4,209
†Kittitas, Commercial Club	(225)
Roslyn	3,126
South Cle Elum	(500)
KLICKITAT COUNTY	10,180
*Goldendale, Fruit & Produce Association	1,203
†Guler, Trout Lake Commercial Club	(400)
†Laurel, Development Club	(50)
†Lyle, Commercial Club	(173)
White Salmon, Commercial Club	682
LEWIS COUNTY	32,127
Centralia, Commercial Club	7,311
*Chehalis, Citizens' Club	4,507
†Mineral, Commercial Club	(350)

	Population
Morton, Commercial Club	(400)
†Mossyrock, Commercial Club	(150)
Napavine	(280)
Pe Ell, Commercial Club	838
Toledo, Commercial Club	375
Vader, Little Falls Commercial Club	(631)
†Vance, Commercial Club	(100)
Winlock, Commercial Club	1,140
LINCOLN COUNTY	17,539
Almira, Commercial Club	368
Creston, Commercial Club	308
*Davenport, Booster Club	1,229
Harrington, Commercial Club	661
Odessa, Commercial Club	885
Reardan	527
Sprague, Commercial Club	1,110
Wilbur, Publicity Club	757
MASON COUNTY	5,156
*Shelton, Commercial Club	1,163
OKANOGAN COUNTY	12,887
Brewster, Booster Club	296
†Chesaw, Commercial Club	(200)
*Conconully, Commercial Club	357
†Methow, Commercial Club	(50)
Okanogan, Commercial Club	611
Omak, Commercial Club	(300)
Oroville, Development League	495
Pateros, Commercial Club	(316)
Riverside, Commercial Club	(250)
†Tonasket, Commercial and Good Roads Club	(200)
Twisp	227
†Winthrop, Commercial Club	(100)
PACIFIC COUNTY	12,532
†Chinook	(450)
Ilwaco, Commercial Club	664
†Long Beach, Commercial Club	(300)
Raymond, Commercial Club	2,450
*South Bend, Commercial Club	3,023
PEND OREILLE COUNTY (organized, 1911)	
Ione, Commercial Club	634
Metaline Falls, Commercial Club	(400)
†Newport, Commercial Club	1,199
PIERCE COUNTY	120,812
Buckley, Chamber of Commerce	1,272
Du Pont	(500)
Eatonville, Commercial Club	754
Kapowsin, Improvement Club	(600)
Milton	448
Orting, Commercial Club	799
Parkland, Civic Improvem't Club	
Puyallup, Commercial Club	4,544
Roy	315
Ruston	780
South Prairie	264
Steilacoom	430
Sumner, Commercial Club	892
Tacoma, Commercial Club & Chamber of Commerce	83,743
Wilkeson, Commercial Club	899
SAN JUAN COUNTY	3,603
Friday Harbor, Improvement Club	400
Roche Harbor	(250)
SKAGIT COUNTY	29,241
Anacortes, Chamber of Commerce & Manufacture	4,168
Burlington, Commercial Club	1,302
Concrete, Commercial Club	945
Hamilton	405
LaConner, Chamber of Commerce	603
Lyman, Commercial Club	441
McMurray	(400)
Mount Vernon, Commercial Club	2,381
Sedro Woolley, Commercial Club	2,129
SKAMANIA COUNTY	2,887
Carson, Carson Valley Development Club	(250)
*Stevenson, Board of Trade & Optimist Club	387
SNOHOMISH COUNTY	59,209
Arlington, Chamber of Commerce	1,476
Edmonds, Chamber of Commerce	1,114
Everett, Commercial Club	24,814
Gold Bar, Commercial Club	(750)
Granite Falls, Business Men's Association	714
Zillah, Commercial Club	(500)
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	Population
Marysville	1,239
Monroe, Commercial Club	1,552
†Mukilteo, Commercial Club	(700)
Snohomish, Commercial Club	3,244
Stanwood, Commercial Club	544
†Startup, Improvement Association	(200)
Sultan, Commercial Club	576
SPOKANE COUNTY	139,404
Cheney, Commercial Club	1,207
Deer Park, Commercial Club	875
Fairfield, Commercial Club	308
Hillyard, Chamber of Commerce	3,276
Latah	339
†Meadow Lake, Commercial Club	(500)
Medical Lake, Commercial Club	1,730
†Opportunity, Commercial Club	
Rockford, Business Men's Club	663
Spangle, Commercial Club	299
*Spokane, Chamber of Commerce	104,402
Waverly, Commercial Club	318
STEVENS COUNTY	25,297
Chewelah, Commercial Club	823
†Clayton, Commercial Club	(350)
*Colville, Chamber of Commerce	1,512
†Gifford, Commercial Club	(150)
†Hunters, Columbia Valley Commercial Club	(300)
Kettle Falls, Commercial Club	377
Marcus, Commercial Club	650
Northport	476
Springdale, Commercial Club	251
THURSTON COUNTY	17,581
Bucoda	(350)
*Olympia, Chamber of Commerce	6,996
†Rochester, Commercial Club	(800)
Tenino, Commercial Club	1,038
Tumwater	490
WAHKIAKUM COUNTY	3,285
*Cathlamet, Commercial Club	352
WALLA WALLA COUNTY	31,931
†Eureka, Business Men's Ass'n	(75)
Prescott, Commercial Club	502
Waitsburg, Commercial Club	1,237
*Walla Walla, Commercial Club	19,364
WHATCOM COUNTY	49,511
*Bellingham	24,298
Chamber of Commerce. Kulshan Club.	
Blaine, Chamber of Commerce	2,289
†Custer, Industrial Club	(150)
†Everson, Commercial Club	(350)
Ferndale, Commercial Club	691
Lynden, Commercial Club	1,148
Nooksack, Commercial Club	(450)
Sumas, Chamber of Commerce	902
WHITMAN COUNTY	33,280
Albion	(350)
*Colfax, Commercial Club	2,783
Colton	393
Elberton	330
Endicott	474
Farmington, Chamber of Com'rce	489
Garfield, Chamber of Commerce	932
†La Crosse, Commercial Club	(350)
Lamont, Commercial Club	(350)
Malden, Commercial Club	798
Oakesdale, Commercial Club	882
Palouse, Business Men's Ass'n	1,549
Pullman, Chamber of Commerce	2,602
Rosalia, Chamber of Commerce	767
St. John, Commercial Club	421
Tekoa	1,694
†Thornton, Commercial & Agricultural Association	(250)
Uniontown	426
†Winona, Commercial Club	(300)
YAKIMA COUNTY	41,709
†Byron, Commercial Club	(100)
Grandview, Commercial Club	320
Granger, Commercial Club	453
Mabton, Commercial Club	666
†Naches City, Commercial Club	(250)
*North Yakima, Commercial Club	14,082
†Outlook, Commercial Club	(200)
Sunnyside, Chamber of Commerce	1,379
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Winthrop, Okanogan County	
Woodland, Cowlitz County	
Wool	
Yacolt, Clarke County	
Yakima City, Yakima County	
Yakima County	
Yakima and Wenatchee Valleys	
Zillah, Yakima County	

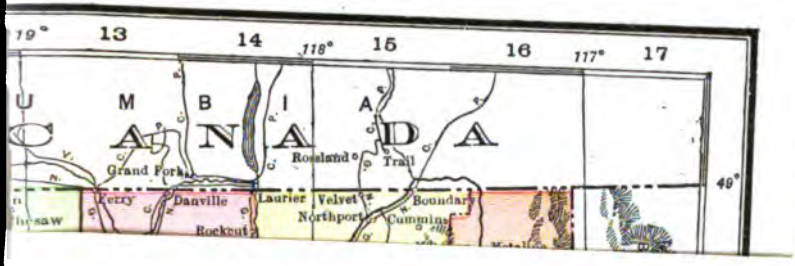
ABSTRACT SHOWING BANKS OF THE STATE.

(Taken from The Banker's Register, Issued July, 1913.)

Counties.	Number and Kind. National.	State.	Private.	Total.
Adams	4	3	1	8
Asotin	1	3	1	5
Benton	2	4	2	8
Chehalis	3	7	...	10
Chelan	1	7	1	9
Clallam	1	3	...	4
Clarke	2	7	...	9
Columbia	2	1	...	3
Cowlitz	1	3	...	4
Douglas	..	4	1	5
Ferry	..	2	...	2
Franklin	1	1	2	4
Garfield	..	1	1	2
Grant	1	7	2	10
Island	..	3	...	3
Jefferson	1	2	...	3
King	7	40	9	56
Kitsap	1	3	...	4
Kittitas	1	5	...	6
Klickitat	1	4	3	8
Lewis	2	9	2	13

Counties.	Number and Kind. National.	State.	Private.
Lincoln	2	11	
Mason	..	1	...
Okanogan	3	9	
Pacific	..	5	
Pend Oreille.	1	2	...
Pierce	3	11	
San Juan	..	1	...
Skagit	3	9	1
Skamania	..	1	...
Snohomish	4	12	1
Spokane	9	19	2
Stevens	2	9	1
Thurston	2	1	...
Wahkiakum	..	1	...
Walla Walla.	4	4	2
Whatcom	3	8	1
Whitman	6	24	3
Yakima	6	12	1
Totals...	80	259	43

te of Washington.



TOURISTS

BE SURE YOUR TICKETS READ
ONE WAY THROUGH THE

State of Washingt

WHEN VISITING THE

Panama-Pacific International

AND THE

Panama-California Expositions

1915

SPEND A WEEK IN

WASHINGTON

"THE EVERGREEN STATE"

Where flowers bloom out doors the year 'round
Where scenery vies with the whole world
Where sun-stroke never claims a victim
Where blizzards and cyclones are unknown
Where thunder is seldom heard
Where summer nights are cool and invigorating

AUG 6 1918

MANUFACTURING OPPORTUNITIES IN THE STATE OF WASHINGTON

BY HARRY F. GILES - DEPUTY COMMISSIONER
STATE BUREAU STATISTICS & IMMIGRATION
I. M. HOWELL - SECRETARY OF STATE-EX-OFFICIO COMMISSIONER

STATE OF WASHINGTON

DEPARTMENT OF STATE

Bureau of Statistics and Immigration

I. M. HOWELL, Secretary of State
Ex-Officio Commissioner

MANUFACTURING OPPORTUNITIES IN THE STATE OF WASHINGTON

By HARRY F. GILES,
Deputy Commissioner

OLYMPIA, WASH.
FRANK M. LAMBORN PUBLIC PRINTER.
1918

"THIS IS THE FOREST PRIMEVAL."

There are trees in the Washington forests over 500 years old and more than 20 feet in diameter.

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NEW REVISED, COLORED MAP OF WASHINGTON.

Snoqualmie Falls (268 feet) the Niagara of the West. 24,000 H. P. has been developed, and is transmitted to Seattle, Tacoma, Everett and other Puget Sound cities.

PREFACE.

The following chapters comprise the results of a more or less complete survey of conditions favoring the establishment of additional manufacturing plants in the State of Washington. The broadness and diversity of the subjects discussed preclude the presentation of numerous details, although the essential facts bearing on an enterprise have been emphasized as much as possible.

This publication will have accomplished its chief purpose if it serves to awaken an interest in Washington's manufacturing possibilities on the part of those in a position to take advantage of the opportunities offered and encourage them to make further investigations. That there is room in this state for many additional establishments in various lines is beyond dispute, and success in many instances depends entirely upon the degree of business ability brought into play.

In presenting the individual requests of the different communities, however, no responsibility is assumed by the Bureau in the final decision as to whether any particular place fulfills all the requirements for the success of the enterprise requested. The suggestions offered here are to serve only as a guide. By following up the leads given it is hoped that the prospective manufacturer, seeking a place to ply his favorite vocation or invest his capital along industrial lines, will be enabled to find out where the best chances lie or what locations merit more thorough investigation.

Additional information will be gladly furnished and any possible assistance rendered by the State Bureau of Statistics and Immigration, the Industrial Bureau of the State University, and the Departments of Science and Engineering of the State University and State College.

It is proper here to thank all persons who by supplying information, offering suggestions, or contributing special articles have cooperated to make this compilation possible.

Wooden-ship yard and portion of manufacturing district, Vancouver, Washington. (Taken from interstate bridge over Columbia river)

(Copyright by Gordon Stuart)

CHAPTER I.

WASHINGTON.

In acquiring a thorough understanding of the industrial progress which any particular territory has made and the opportunities which it presents for further development, some knowledge of its most characteristic natural features is helpful. Although a complete description of the State of Washington cannot be given in this publication, nevertheless it seems desirable to add a few statements of general significance, as a proper introduction to the chapters following and for the light they may throw on the specific subjects discussed. Persons desiring a more detailed description of the state should write to this Bureau for special publications on that subject.

AREA AND POPULATION.

Washington consists of 39 counties, the largest of which is Okanogan, in the north central part of the state, and the smallest Wahkiakum in the southwest corner. Its total land area is 66,836 square miles or 42,775,040 acres. In addition, within its boundaries are 2,291 square miles of water, making its total area 69,127 square miles. Its extreme breadth is 364 miles and the greatest distance north and south 238 miles. The population in 1910 was 1,141,990 and the United States Census Bureau estimate for July 1, 1917, was 1,597,400, or an average of 24 persons for every square mile of land.

SURFACE.

The surface presents every variety of physical formation within the range of geological possibility. The most conspicuous feature is the Cascade Mountain Range, which, rising to an average height of from 5,000 to 8,000 feet, extends in a southwesterly direction from the Canadian boundary to the Columbia river and separates the state into two important geographical divisions known as Eastern and Western Washington, which differ considerably in topography, climate, soil and vegetation.

This range includes also several mountains of national fame which reach to a height of ten thousand feet and more, among which are Mount Rainier (or Mount Tacoma) 14,408 feet, the second highest mountain in the United States proper, and one of the greatest tourist objectives in the world; also Mount Adams, Mount Baker, Mount St. Helens and Glacier Peak.

Other mountains of importance are the Olympics, a range occupying the peninsula of the same name and comprising most of the counties of Jefferson and Clallam and parts of Mason and Grays Harbor. The Blue Mountains, rather low mountains covered with pine timber, occupy a part of the southeast counties and reach into Oregon, while the Okanogan highlands, a sort of spur from the Cascades, occupy the four northern counties of eastern Washington.

All of eastern Washington and much of southwestern Washington is drained by the Columbia river and its tributaries, while the remainder of the western part of the state is drained by smaller rivers flowing directly from their glacial sources into the Sound, the Ocean, or Grays and Willapa Harbors.

AGRICULTURAL AREAS.

Sloping gently from the foothills to the Sound, the Pacific Ocean or the Columbia river on the west side, and to the Columbia river on the east side, are magnificent agricultural areas consisting of plateaus and spreading plains, occasionally interrupted by low hills or broken by beautiful, broad valleys. These areas, at times gently or roughly rolling and again perfectly level, supply the cities located in their midst with all the farm produce needed for home consumption and still have much to send to the preserving factories or to ship to distant lands.

WESTERN WASHINGTON.

Western Washington, consisting of the 19 counties west of the Cascades, was at one time all very heavily timbered with trees reaching enormous size, even twelve feet in diameter for firs and twenty feet for cedars. The sections from which this timber has been cut are now either in the logged-off state, much

of which is used for pasture, or else cleared and under cultivation. Since the soil here is generally good and the rainfall nowhere less than 20 inches annually and in most parts from 30 to 60 inches, nearly all crops grow profusely, especially oats, grasses, vegetables, and fruits, both large and small.

About two-thirds of the population of the state dwell west of the Cascades and principally in the cities located on Puget Sound, Grays Harbor, Willapa Bay, the Columbia River, and on the lines of transportation connecting these sections with each other.

TIMBER.

Much of the timber still remaining is on the mountain slopes and foothills and about a third is included in eleven United States Forest Reserves, the total area of which in the State of Washington amounts to 9,927,679 acres, while of privately owned timber there are about 5,000,000 acres additional. These reserves cover 1,534,680 acres of the Olympic Peninsula, several million acres of the Cascade range, considerable of the Okanogan highlands and some of the Blue Mountains. By far the thickest growth to the acre is in western Washington where the big Douglas fir and the red cedar grow. The eastern Washington sections have a lighter growth of pine, hemlock, tamarack and spruce.

EASTERN WASHINGTON.

Eastern Washington comprises the twenty counties lying east of the Cascades. The Okanogan Highlands occupy the main portion of the northern counties, viz., Okanogan, Ferry, Stevens, and Pend Oreille, the bulk of whose population is to be found in several beautiful, fertile valleys created by the Okanogan, Curlew, Colville and Pend Oreille rivers; although the recent throwing open of the Colville Indian Reservation has caused considerable influx of white population into this splendid section, lying just north of the Columbia and extending eastward from the Okanogan river. In the neighboring mountains and hills is much grazing and mining.

The great Columbia river plain ranging in altitude from 300 to over 2,000 feet occupies most of the remaining portion of Eastern Washington, extending from the Cascades eastward beyond the Idaho Boundary line and southeast to the Blue Mountains. The major part of this area, except the irrigated valleys, is devoted to the raising of grain, principally wheat, although many other crops and much livestock are raised as well. The rainfall ranges from 10 to 20 inches annually.

IRRIGATED SECTIONS.

Besides the wheat plateau there are a number of wonderful valleys where irrigation is successfully practiced and where the major part of all eastern Washington crops, outside of grains, is produced. The chief of these valleys are the Yakima, Wenatchee, Spokane, Walla Walla and Okanogan, although some irrigation is also carried on along the Columbia river itself and the Snake river, besides a number of smaller streams. A still smaller area is irrigated from wells. There are altogether in the state about 400,000 acres of irrigated land and of this about 300,000 acres are in the Yakima Valley. The Wenatchee Valley is devoted almost entirely to fruit production but the other valleys, in addition to fruit raising, pay considerable attention to diversified farming. Within these valleys are the largest cities of eastern Washington, where dwell the bulk of its population.

CHIEF INDUSTRIES.

The chief industries of the state are farming, dairying, fruit raising, lumbering and other manufacturing, fishing and mining. All crops in the state for the year 1916 were estimated to be worth $128,000,000. Livestock was worth about $47,000,000. Manufacturing probably amounted to about $250,000,000. The fishing industry produces from $10,000,000 to $20,000,000 annually and mining about $14,000,000. The total wealth of the state is about two billion dollars. Figures for 1917 are not yet available.

Lower Spokane Falls, in the heart of Spokane, the "Power City."

CHAPTER II.

DEVELOPMENT OF MANUFACTURING IN THE STATE OF WASHINGTON.

What any region can contribute toward the progress and general contentment of a people depends primarily upon the liberality with which it has been endowed with desirable resources, and the character of the men who gain control of them.

The most casual survey of the natural advantages possessed by the State of Washington and a moderate acquaintance with its men of affairs can hardly fail to convince the thoughtful person that this northwestern section of the United States is destined to become one of the great industrial regions of the world. Unlimited quantities of essential raw materials have been placed where they may be utilized to the fullest extent. So varied are these materials and so favorable the conditions surrounding them, that, as the work of development proceeds and the uses to which they may be put become more familiar, few manufactured articles of a general nature will be known which cannot be produced in this state, providing the enterprise is adapted to a temperate zone.

The time is ripe for a period of unusual progress in nearly all lines of manufacturing. Persons with foresight are beginning to realize the possibilities and are preparing to profit by the industrial growth that is expected.

TWENTY YEARS OF GROWTH.

But, leaving the contemplation of future events for the present, this chapter will be devoted to a brief outline of what has already occurred, especially during the past 20 years. The development of the state during that period has been in many respects remarkable. In 1890, the year after admission to the Union, the total value of all manufactures was reported by the United States Census Bureau to be $41,768,022. By 1899 it had more than doubled, amounting to $86,795,051, which for comparative reasons was reduced to $70,831,000 by elimination

of many small concerns not conducted according to regular factory methods. In 1904 the value of all manufactured products amounted to $128,822,000, representing an increase of 81.8 per cent. over what it was five years before. The regular census report of 1910 shows that the total value of manufactured products had advanced for the year 1909 to the stupendous sum of $220,746,000, which represents the largest increase during any five year period in the history of the state, being 71.4 per cent. over that of the year 1904 and 211 per cent. over the year 1899.

RECENT DEVELOPMENT.

The rate of increase during the years from 1909 to 1914 was considerably less than for any equal previous period, but the same was true for practically all other parts of the United States and for much of the rest of the civilized world, since a process of liquidation was going on while we were recovering from the preceding years of inflation.

This brief retardation has been more than offset, however, by the rapid development which has occurred since 1914. If the figures could now be obtained for the year 1917, they would undoubtedly record a much larger increase than ever before. The industrial awakening which started near the Atlantic seaboard, closest to the scene of the European conflagration, spread rapidly toward the Pacific Coast; where dense forests of giant trees envelop mountains whose rugged slopes conceal unlimited quantities of useful and precious metals and concentrate the rushing waters into falls of sufficient potential power to turn the mills of the world; where rich agricultural areas capable of producing a profuseness of crops are within easy reach of the sea, which also yields freely various foods and materials and receives the great ships building at every port.

Quickening to the keen demands of the day, all things seem to have increased in prolificness. Fishermen have met with signal success and the canneries of the Coast have been taxed to their full capacity. The farmer, the dairyman, the stockman and the orchardist have laid hold with added zeal, to compel

the rich soil to yield its utmost and supply fruit and vegetable canneries, condenseries, meat packing establishments, flour mills and other food preserving plants with the materials which will ultimately feed those living where such things do not thrive, or people too busy in other pursuits to attend to the details necessary for their successful production. Thousands of huge logs are being cut from the forests and manufactured into lumber, either to be shipped to distant lands less fortunate in this respect than the Pacific Northwest, or to supply the needs of our own citizens already engaged in the work of empire building, and for the construction of great cargo-bearing ships for carrying other products across the seas.

SCIENTIFIC INVESTIGATIONS.

Instead of being satisfied with progress made at any particular time, investigations have been made and are being continued by federal authorities and state institutions to discover other lines that might deserve attention. As a result, many new fields for the manufacturer's activity are being found. Beet sugar and starch factories, paper and pulp, also steel manufacturing, besides many miscellaneous lines mentioned elsewhere in this publication, have been shown to offer possibilities, while for wooden shipbuilding and airplane construction it is generally admitted that no location anywhere is more favorable.

STATISTICS OF CAPITAL AND LABOR INCREASE.

Such increase in manufacturing, of course, implies a proportionate growth in the capital invested and indicates a much larger army of wage earners engaged. In 1880 there were only 261 establishments of all kinds, including even the small ones which are not counted in later census reports because of not being managed under the factory system. These 261 concerns employed 1,147 men and represented invested capital amounting to $3,202,497. By 1914 the number of establishments had increased to 3,829, which gave employment to 67,205 wage earners and represented of invested capital nearly $300,000,000, or about one-seventh of the entire wealth of the state.

Between 1899 and 1914, a period of fifteen years, the number of establishments and wage earners had doubled, the capital invested had increased 568 per cent. and the yearly value of manufactured products had increased 245 per cent., thus raising the rank of the state to 23d in the Union in reference to value of products and 19th in reference to value added by manufacture.

In may be safely estimated that during the period of twenty-five years from 1889 to 1914 altogether about three billion dollars' worth of goods were manufactured in Washington, representing about $150 for each person living in the state during any one year, or $3,750 for each person living in the state the entire twenty-five years, and proportionate amounts for those living in the state shorter periods. For the year 1914, when the population was about one and a half millions, the output for each person was about $163.00. In the year 1909, with a population of 1,141,190, the value per person was about $168.00.

TABLE SHOWING GROWTH OF MANUFACTURING FROM 1880 TO 1914.

YEAR	Population	Establishments	Wage Earners	Capital	Value of Products	Value Added to Manufacturing	Average Per Capita
1880.....	75,116	261	1,147	$3,202,497	$3,250,134	$1,282,665	$43
1890.....	357,232	1,543	18,677	34,369,735	41,768,022	21,850,965	117
1899.....	518,103	1,926	31,523	41,575,000	70,831,000	32,554,000	136
1904.....	700,000	2,751	45,199	96,953,000	128,822,000	62,656,000	184
1909.....	1,141,990	3,740	69,120	222,261,000	220,746,000	102,858,000	168
1914.....	1,500,000	3,829	67,205	277,715,000	245,326,000	108,717,147	163

COMPARISON WITH OTHER INDUSTRIES.

Manufacturing, of course, holds an important relationship to all other industries, since it depends on them for the materials needed in the process of transformation. In this state it ranks next to agriculture in relative importance. The value of all manufactured goods for the year 1914 amounted to $245,326,456, or about one-eighth of the entire taxable wealth of the state, but the increased value from manufacturing amounted to $108,717,147. During that same year the value of all crops was nearly $100,000,000, while livestock, dairy and poultry

No. 1. Opening of Lake Washington Canal, which added 100 miles of fresh water frontage to Seattle's already extensive shoreline.
No. 2. Harbor Island, one of Seattle's most important manufacturing districts.

products would add many millions more, and bring the total from all agricultural pursuits to approximately $125,000,000, or about 15 per cent. more than from manufacturing. Although manufacturing has reached much larger proportions for the year 1917, agriculture also has increased. Fishing, next in importance, yields annually from $15,000,000 to $20,000,000 and mining about $14,000,000. Thus it is apparent that about one-third of the annual wealth production of the state is from manufacturing alone.

These figures represent the results of normal times, and will undoubtedly be surpassed by the returns for the year 1917, which will surely record a marked increase, due not alone to abnormal values but also to the larger production in every line of industrial endeavor. Every eight years, during normal times, we have practically reproduced the taxable wealth of the state from manufactured products alone, but recent developments will undoubtedly cause such results in a much shorter period.

IMPORTANT PRODUCTS.

Although Washington ranked 23d in value of all manufactured products and 19th in increased value from manufacture, in a number of lines of supreme importance it stands in the front rank. Of these lumber and lumber products, fisheries products, dairy products, flour and grist mill products, cement manufacturing, clay products, fruit and vegetable canning and ship building stand out most prominently. Several of these have such an important relation to the manufacturing progress of the state that special chapters have been devoted to them, where more details may be given and all important facts connected with them, bearing on the general subject of manufacturing, brought to the attention of the reader. Only a brief mention of each one will be made here.

RANKS FIRST IN LUMBERING.

By far the most important of these are lumbering and allied woodworking industries. For the year 1914 the total value of all lumber and timber products was $83,535,760, or 34 per cent. of the entire manufacturing output. About four billion feet of lumber are cut annually, but enough timber

still remains in the forests to last another hundred years at practically the same rate of cutting and without considering the increased production through efforts at reforestation. Washington soil and climate are well adapted to tree growth, only 75 years being required to reproduce marketable timber. Out of the magnificent growth of red cedar are manufactured two-thirds of all of the shingles produced in the United States. In the annual output of lumber for the past ten years, except one, Washington has ranked first in the Union, and its total production during the ten-year period amounted to nearly forty billion board feet, worth as rough lumber more than $500,000,000, a truly substantial contribution to the wealth of the country. This has found its way to South American ports, British Columbia, Alaska, eastern United States and European and Asiatic ports.

LUMBER PRODUCED IN WASHINGTON DURING THE YEARS 1907 TO 1916 INCLUSIVE.

	Bd. Ft. Cut	Value
1907	3,777,606,000	$54,849,114 00
1908	2,915,928,000	37,090,925 00
1909	3,862,916,000	51,083,399 00
1910	4,097,492,000	68,786,820 00
1911	4,064,754,000	59,856,159 00
1912	4,099,775,000	49,690,032 00
1913	4,592,053,000	.....
1914	3,946,189,000	.....
1915	3,950,000,000	41,814,078 00
1916	4,492,997,000	53,159,502 00
Total for 10 years	39,799,710,000	.....

FISHERIES PRODUCTS AND LIVESTOCK.

With the keen demand for foods and the growing scarcity of domestic animals, which are being rapidly slaughtered in many places to provide meat diet or because of the higher cost of feeding them, the development of Washington's fish and livestock products is of extreme importance. Livestock in the state being valued at about $50,000,000, and the annual production of salmon and other fish products amounting to from $10,000,000 to $20,000,000, Washington is surely doing its

share towards feeding the armies in the field as well as the civilians at home. During the year 1914 the total products from meat packing, including beef, veal, mutton and lamb, pork and other fresh and cured meats and miscellaneous products, amounted to $18,443,526. In 1909 the value was $15,653,998, and in 1904, $6,251,705, representing an advance of about 200 per cent. for the year 1914 over what it was in 1904.

The value of canned fish alone for the year 1914, one of the "off" years, according to the United States Census report was $7,634,000, an amount surpassed by no other state but Maine and then by only about $20,000. Washington is the leading district for canned salmon, including the Puget Sound, Columbia river and Alaska products. A special bulletin on this subject may be obtained by writing the State Bureau of Statistics and Immigration, Olympia, Washington.

CEREAL PRODUCTS.

Flour and grist mill products and opportunities for further development along this line will be considered in a special chapter, but a brief statement is warranted here. Government reports show that 37,635,000 bushels of wheat valued at $53,818,000 was produced in 1916 and that the annual yield sometimes goes much higher. Of oats, 14,300,000 bushels were produced; of barley, 6,814,000 bushels; and corn, which is just beginning to be raised in the state, amounted to 1,406,000 bushels. The value of products manufactured from all these is second only to the lumber industry and amounted in the year 1914 to $23,665,000. This industry was represented by 100 establishments, which produced 3,765,070 barrels of flour, valued at $15,685,353; 120,260 tons of feed and offal, valued at $3,588,665; 121,537 tons of bran and middlings, valued at $2,675,237; 8,413,648 pounds of breakfast foods, worth $251,117; besides rye flour, barley meal and other cereal products, bringing the total up to the figures mentioned.

During the five years from 1909 to 1914, wheat flour manufactures increased from 2,804,242 barrels to 3,765,070 barrels, representing an increased value of 25.6 per cent. In addition there were manufactured of bread and other bakery products,

amounts worth $6,572,000 in 1914, as against amounts valued at $4,570,000 in 1910, and $656,000 in 1904.

DAIRY MANUFACTURES.

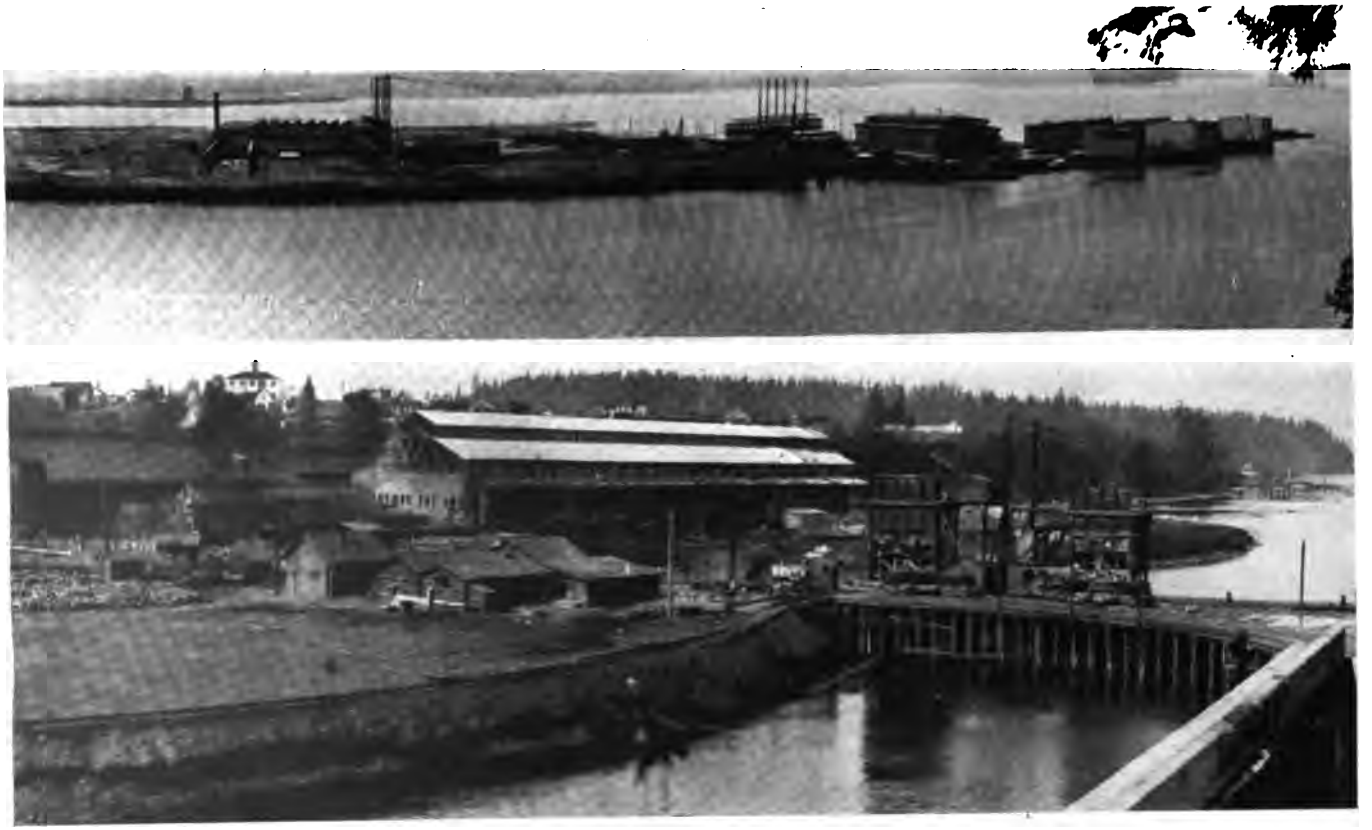
No industries have advanced faster and probably none present greater opportunities for the future than those connected with dairying and livestock production. Since 1904, the total annual increase in butter, cheese and condensed milk, according to the U. S. Census, has been about 300 per cent. While in 1904, 7,722,911 pounds of butter, worth $1,968,682, were sold, in 1914, 16,813,044 pounds valued at $5,107,803 were sold—an annual increase in quantity of about 117 per cent. within 10 years, or 48.8 per cent. within the last five year census period. Cheese increased from 921,383 pounds to 1,355,423 pounds, while condensed milk, now one of the most important manufactures connected with dairying, grew from practically nothing to about $5,000,000.

SHIP BUILDING.

The development in ship building has been almost startling. Previous to 1917 very few vessels of any consequence had been built except the U. S. battleship Nebraska, constructed in a Seattle ship yard in 1908. In 1914 there were 61 ship and boat building plants reported, but very few ships of importance were being built. Today there are contracts for great cargo ships amounting to more than $200,000,000. The leading facts connected with this industry are discussed in a special chapter.

AEROPLANES.

The latest line of importance is the construction of aeroplanes. Washington possesses the most essential of all factors for this enterprise, namely, a large supply of high grade spruce timber, pronounced by government experts to be the ideal wood because of its toughness and comparative lightness. This tough light timber, of which there are more than twelve billion feet in the state, has of late become so valuable that it is barred from all lines of construction in which any other kind of wood will do, for there is no material that can take its place with the same



No. 1. Tacoma steel-ship building plant nearing completion. No. 2. Partial view of Tacoma's big smelter. Annual output is valued at $40,000,000. One-twelfth of copper output of the United States is refined here.

degree of efficacy. Already a few aeroplanes have been built in the state, but the next year or so will probably find Washington one of the foremost districts in this respect.

PAPER AND PULP.

Much headway has been made in the paper and pulp industry. The favorable conditions, especially plenty of suitable timber, according to a number of experts, promise a rapid advancement in that line. There are at present four large paper plants in the state, one each at Everett, Camas, Sumner and Spokane. A number of others are being located or planned for location at favorable points.

OTHER IMPORTANT MANUFACTURES.

Among other important manufactures amounting to more than a million dollars each in 1914 and which have continued to make tremendous increases, are cement, amounting to $2,639,219 from five plants; brick and tile, terra cotta and fire clay products, amounting to $2,026,801 from 40 establishments in 1914, as against $1,091,000 from 57 in 1904; confectionery, amounting to $1,783,000 from 67 establishments in 1914, as against $1,311,000 from 28 establishments ten years before; copper, tin and steel, amounting to $1,620,000 in 1914 from 112 establishments, as against $727,000 from 33 establishments in 1904; furniture, which amounted, in 1914, to $1,098,000 from 50 establishments, as against $625,000 from 23 plants in 1904; illuminating and heating gas, which in 1914 returned $2,639,000 from 13 plants, as against $602,000 from 7 plants in 1904; and cars and general shop construction and repairs by steam railroad companies, which increased from $2,769,000, the product of 10 plants in 1904, to $7,027,000, the results of 26 plants in 1914. Roasting and grinding of coffee and spice increased from $524,000 to $2,237,000 in the same period; foundry and machine shop products increased from $3,945,000 to $6,837,000; printing and publishing increased from $4,765,000 to $9,824,000 in ten years; and malt liquors, whose manufacture has since been prohibited by law, but which is now being supplanted

by the manufacture of various fruit juices, grew from $4,472,000 to $9,458,000 in the same ten-year period.

Many other minor industries have also attained prominence during the past ten years. Some of these, although affecting the total figures very little, are important as regards their general bearing on the manufacturing progress of the state and proving its suitability for industrial diversity. Among the minor manufactures are leather goods, tobaccos and cigars, mattresses and spring beds, cooperage goods, mineral and soda waters, ice, awnings, tents and sails, besides clothing, agricultural implements, chemicals and various other miscellaneous manufactures, such as ink, hats, glass, fertilizers, fireworks, cordage and twine, bags, cigar boxes, brushes, buttons, etc.

Every year new lines of manufacturing are attempted. Many of them succeed and constitute further proof that the State of Washington is not confined to a few lines only, but can successfully engage in nearly all lines for which the necessary raw materials can be produced in a temperate zone or be shipped at a profit from some other part of the planet.

MANUFACTURING DISTRICTS.

Although industrial expansion has occurred in many parts of the state, the development experienced in the different places is not always along the same lines. Other things being equal, the largest centers will usually attract the greatest number of enterprises. But in many instances local conditions or superior advantages will play an important part in the encouragement of such enterprises. This is especially true regarding those industries which can best be handled close to the source of raw material, such as preserving, canning, milling, sugar refining, lumbering, etc., although the excellence of our transportation facilities permits the carrying of certain materials a considerable distance—a wise and profitable thing to do when the other essential conditions are already present at any particular place. In cereal, fruit and vegetable products, Eastern Washington, where the largest improved agricultural areas exist, has made the most headway. In lumber and remanufactures therefrom,

ship building and fisheries, the western part of the state must naturally claim the lead.

Practically all lines of manufacturing are carried on in Spokane, the metropolis of the Inland Empire, as they are in Seattle, Tacoma, and the other larger centers of western Washington. The manufactures of each of these three cities for the year 1914 amounted to $16,636,309 for Spokane, $27,707,606 for Tacoma and $64,475,442 for Seattle. The other cities for which special figures were supplied by the U. S. Census were: Aberdeen, $4,815,113; Bellingham, $6,264,307; Everett, $6,530,405; Hoquiam, $5,009,410; Yakima, $1,937,461; Vancouver, $1,301,048, and Walla Walla, $2,014,673. The population of these cities ranges from 12,000 to over 300,000. Other important manufacturing centers with less than 10,000 inhabitants are Port Angeles, Port Townsend, Anacortes, Snohomish, Puyallup, Olympia, Centralia, Chehalis, Ellensburg, Wenatchee and the Willapa Bay, and several Skagit valley cities. Many other towns are gradually attaining greater proportions and some of them will probably in time become important manufacturing centers.

POTENTIALITIES.

But it is not so much with achievements as with potentialities that the average person who reads this book is most concerned. His question is, what are the lines that still offer opportunities and what are the reasons for such expectations? The following pages represent an attempt to answer such questions as fully as possible. Mention is made of all conditions that seem to favor development and some consideration given to the reasons for expecting such development. No effort is made, however, to minimize the value of experience and well directed effort, which are always necessary in every legitimate line of endeavor. Capital and captains of industry are of course needed for the greater accomplishments; but many opportunities for less pretentious enterprises are awaiting those persons having only limited capital, who possess enthusiasm, and confidence in their own ability to win success.

CHAPTER III.

ADAPTABILITY OF THE STATE FOR MANUFACTURING.

In order for any section of a country to attain industrial magnitude, certain natural advantages are essential. The needed raw materials must be present in commercial quantities and they must be found where the transportation facilities are sufficient. Plenty of cheap power is necessary. Good factory sites must be obtainable on reasonable terms. Markets to absorb the finished products must exist or the chances for creating them must be apparent. Labor conditions must also be satisfactory, while the climate should be such as to render outdoor work possible most of the year and the general environment such as to appeal to man when choosing a place for his home.

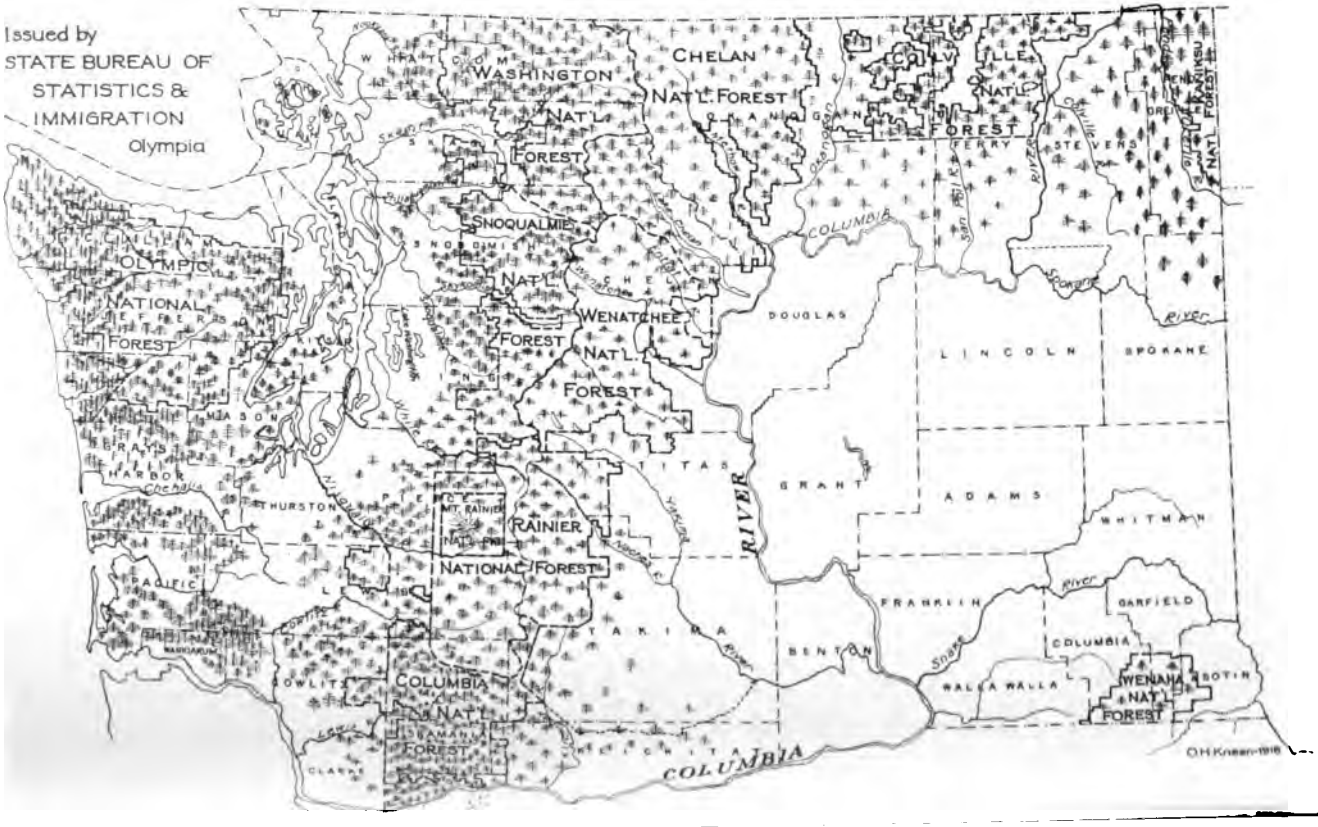
There are also a number of advantages that are more or less local in their nature, and the extent of development made possible by these fundamental requirements in any particular section will depend in a measure on the special conditions which obtain there. In a state of such varied resources and diversified interests and occupations, it follows that some industries which attain a high development in one locality might be unsuited to another. Considered, however, along general lines, that portion of the North American continent included within the boundaries of the State of Washington seems to contain the essentials for producing a manufacturing district equal in importance to any in the United States.

Since most of these advantages are discussed in connection with the various articles on specific subjects, this chapter will be devoted to a brief consideration of such advantages in their relation to the broad field of manufacturing in the State of Washington, leaving detailed discussion and special applications to other chapters.

EARLIEST MANUFACTURING CENTRES.

With few exceptions, the most important industrial centres of the world have been located in the north temperate zone, and have attained their greatest proportions where transportation and power can most cheaply be made to meet. In the early history of this nation, when power-manufacturing in various lines

DISTRIBUTION OF MERCHANTABLE TIMBER IN WASHINGTON



began first to be developed, the need for securing direct water power, converted by means of over-shot or under-shot wheels, caused mills and factories to be built along streams where waterfalls or swift currents were available; and the raw material was transported to, and the finished product conveyed from, the mills, first by boat or wagon, later by steam cars. In this way such manufacturing districts as those of New England and other Atlantic seaboard states were developed, where the mountain streams of the Appalachian watershed dashed swiftly downward toward the sea.

The discovery of the vast coal beds of Pennsylvania and other states, and the improvements of the steam engine with its various applications, provided a new power supply. These improvements and the ease of transporting coal from the mines to the harbor ports caused great manufacturing districts to spring up in such cities as New York, Baltimore, Philadelphia and Boston, on the Atlantic coast, or as Detroit, Cleveland and Chicago, on the Great Lakes.

During the past score of years, new inventions and the discovery of new principles have brought about new applications of old forces, so that today, electrical energy, cheaply generated by water power or steam, can be transmitted many miles at a low cost and with little loss. Individual motors are taking the place of intricate shafting and belt drives in the modern factories, thus insuring greater conservation of power and more safety to employees.

UNLIMITED POWER.

Among the immediate advantages to the Pacific Northwest of such advancement is the possibility of utilizing more of the almost unlimited water power located in its hills and lofty mountains. The State of Washington is particularly fortunate in this regard, for it possesses nearly one-fifth of the entire potential water power of the United States, and most of this is so located that it may be readily and cheaply transmitted to all the great manufacturing centres of the state and neighboring territory.

Supplementing it, is the dormant power reposing in the enormous beds of coal in our own state and the greater coal fields

of Alaska, lying, as it were, next door, together with the vast quantities of unmerchantable timber of our dense forests and the waste from the sawmills engaged in manufacturing lumber for the market. All this material is so located as to be readily accessible to either rail or water transportation.

RAW MATERIALS PLENTIFUL.

Raw materials of many varieties are abundant. Even if a wall were built around Washington, its chances for developing into a greater manufacturing region would be excellent. Its forests comprise some of the richest bodies of timber known. The waters of its rivers and inland seas teem with many varieties of edible fish, and the efforts of the State Fish Commissioner are directed toward their increase and protection from ruthless fishermen. The fertile valleys and plains are capable of yielding still heavier crops of fruits, vegetables and grains. Dairying and livestock do well in nearly all parts of the state, and some sections are unsurpassed for such industries. In addition, it possesses extensive beds of clay of all kinds, large deposits of silica and lime, rich copper mines, and, in lesser quantities, iron, and most of the precious and semi-precious metals, besides many less important minerals.

NEIGHBORING TERRITORY.

The importance of Alaska to the State of Washington is discussed in a special chapter, but the natural advantages offered by the neighboring territory, Idaho, Oregon and British Columbia, should not be overlooked. These three sections contain a total area of 536,442 square miles and a population (1916) of 1,647,707, which, added to that of Washington, aggregates 605,569 square miles of territory and a population of 3,181,928.

Vast water power and additional raw materials are found in these districts, while ever improving facilities will permit their transportation to the manufacturing centres of any of the four commonwealths. These materials represent some of the richest gold, silver, copper, and coal mines in the world, extensive agricultural and grazing areas, additional forests of big timber, and, excepting Idaho, valuable fisheries resources.

Sugar beets in the Yakima valley and a refinery with 600-ton daily capacity, constructed in 1917. This is a new industry in Washington but is rapidly taking its place as one of the most important in the state.

Their people are also of the true western type and anxious for the development of the Northwest. A rapid increase in population, as shown by recent census reports, is taking place, which must also tend to expand the capacity of the local markets and increase the available supply of skilled workmen.

COMMERCIAL ADVANTAGES.

The geographical location of the State of Washington and its exceptional transportation facilities insure for it a rapid commercial development. Although today its leading manufacturing establishments are engaged principally in converting into useful articles raw materials produced locally, the day is not far distant when this state's far-flung lines of commerce will bring to its cities the materials of every land, and when its factories, as one eastern city now boasts, will produce "everything from battleships to bon-bons." These raw materials will be brought in ever increasing cargoes from Alaska, South America, the Orient and the Islands of Southern Seas; also through the Panama Canal from the Atlantic and Gulf coasts, from the eastern parts of South America, from Europe and possibly Africa, here to be combined with our own natural products and transformed into all manner of useful articles for distribution throughout the civilized world.

Here, on the Pacific Coast, under the shadows of the snow-clad mountains, power now sleeping in the hills or dashing untrammeled down their turbulent torrents will turn the wheels of great textile mills, where the cotton of the southern states and of the Orient, the wool from the western ranges, from Australia and the far East, and the silks of China and Japan, will be spun and woven into fabrics. This potent energy will some day move the machinery of huge leather and rubber factories, where hides from South America, Australia and South Africa, and crude rubber from the Orient will be transformed into boots and shoes, automobile tires and many other articles of commerce, and will drive the engines for great iron and steel plants where every variety of tools and machinery will be produced from iron ore, mined not far from our own mills or brought back as return cargoes by vessels that carry our products to foreign lands.

AVAILABLE SITES.

Not the least important advantage which this state affords for the encouragement of new industries is extensive factory area, well located with respect to transportation and sources of material. In every city of the state where manufacturing plants are called for, or where they may be expected to succeed, plenty of land suitable for such purposes is available, for most of the cities are built either on rivers or on the inland seas where all the requirements of factory sites are present. Many of these locations can be secured by responsible companies gratuitously or for a very reasonable purchase or rental price. The table on page 206 shows the cities which will furnish free sites or render other substantial assistance, and indicates also with whom to correspond for further information.

CLIMATIC ADVANTAGES.

The climate of Washington, already referred to, is favorable not only to agricultural pursuits and the growing of heavy crops, but peculiarly so for many kinds of industrial pursuits. Nowhere in the state can it be said that there are extremes of heat or cold. The U. S. Weather Bureau report for Seattle, which is typical of most of western Washington, shows that for the past twenty-one years, the lowest temperature experienced was 11 degrees F. above zero, while the highest was 96 degrees. The mean annual temperature for this period was 51 degrees, while its average rainfall was 36.6 inches, as compared with 44.6 inches for New York, 57.4 inches for New Orleans and 37.2 for St. Louis.

The extremes of temperature are somewhat greater on the east side of the mountains, but a less humid atmosphere largely compensates for this difference. The annual normal temperature for the Spokane country is 48 degrees, and in the vicinity of Walla Walla 53 degrees. The lowest monthly normal near Spokane is 27 degrees and at Walla Walla 33 degrees. The highest monthly normal near Spokane is 69 degrees and near Walla Walla 74 degrees.

Such a climate permits work with very little interruption throughout the year; there are few days when outdoor labor is

suspended or even retarded. Pipes seldom freeze and no one ever dies of sunstroke or heat prostration. A saving is made in the cost of construction in many cases because it is not necessary to provide against hard freezes, deep snows and penetrating winds. The efficiency of steam plants and of gas is not lowered by extreme cold and the cost of heating factories and mills is reduced to a minimum. Electrical plants are not endangered nor wires subject to disturbance by thunderstorms. Navigation on Puget Sound is never interfered with by ice or wind.

LABOR CONDITIONS AND WAGES.

These conditions also have a beneficial effect upon labor by keeping the operators contented with their surroundings. One laboring man was recently heard to remark, "I could make more money back in..... (naming one of the central states), but it is worth a lot to live in a country like this, where you don't freeze in the winter or roast in the summer; where you can sleep comfortably every night, breathe pure air and wake up in the morning feeling rested." He might also have added: "where everyone who wishes can grow enough vegetables and fruit on one or two ordinary city lots to supply his family; where in most cases one can look from his window upon scenery which rivals that of Switzerland or Italy, or if he desires, follow the inviting trails or highways which lead into the midst of the mountains and forests, where may be enjoyed every variety of healthful recreation and outdoor pleasure which is today recognized as essential for the highest quality of work in any department of a great industrial plant, from the manager's office to the shop floor."

The net result to Washington manufacturers of all these favorable climatic conditions, if reduced to figures, would represent from 15 to 18 per cent. greater efficiency than that realized by most eastern manufacturers. In the meantime the employee can be happy and made to feel that life is really worth living. Factories requiring large numbers of skilled employees will find no difficulty in attracting workmen to the Coast when once they are assured of employment and made familiar with the many advantages of the far West.

In connection with this phase of the subject, too, it should be noted that whatever advantage may have been enjoyed in the past by eastern manufacturers on account of the lower wage scale obtaining in their sections of the country, has now been practically annulled by the rapid increases which have taken place in the East, thus bringing wages in the East and in the West to practically a common level.

A PROGRESSIVE PEOPLE.

The people living in Washington are as a whole of an unusually progressive type and ready to adapt themselves to new lines of work or new methods in performing them. Drawn from nearly every state and nation, the process of immigration has exercised a sort of natural selection, those locating here being generally men and women with energy and ambition. In order that their children and those of future immigrants may be equipped to meet their responsibilities, they have built up a public school system second to none; one which has pioneered in the modern lines of manual and technical training and one which offers systematic and intensive instruction in all lines of recogized importance.

SUMMARY.

Summarizing, the State of Washington is richly endowed in reference to five of the six basic elements necessary for the development of a great industrial section, namely, raw material, transportation, power, factory sites and markets; and presents the most favorable conditions for the sixth, labor, offering as it does a most healthful and agreeable environment to all who toil for a living.

As the industrial development of the state advances, these advantages will be felt still more, for there is a cumulative value in every added factory; the products of one plant may furnish material for the operation of several others, while the expected increase in immigration will strengthen the local market for many lines of goods now manufactured. Further stimulus will be given by the opening of new and greater world markets and the commercial activity which must follow the close of the international conflict.

Modern cement works at Bellingham. Present capacity, 3,000 barrels per day. Ultimate capacity 10,000 barrels per day.

CHAPTER IV.

TRANSPORTATION ADVANTAGES.

The State of Washington possesses exceptional transportation facilities both by land and sea. As a Pacific Coast state it enjoys all the benefits that proximity to a great ocean always insures. But it is more fortunate than most coast regions in the possession of extensive water transportation between different points within its own boundaries and connecting with the ocean itself. Puget Sound reaching with its several arms into the heart of the state, Grays Harbor and Willapa Bay indenting it in the southwest, and the navigable Columbia circling through the eastern Washington region, and bounding the state on the south, together with its tributaries and other navigable streams, are potent factors in developing a superior transportation system.

To reach this rich section of the Northwest was the aim of all the great western railroads. As a result Washington is served today by five transcontinental lines which connect with the ocean carriers at tidewater and transfer the products brought by lateral and local lines from all other parts of the state, thus bringing the advantages of coastal proximity to every city within its boundaries. To increase the efficiency of these roads, several car ferries operate between points on the east and west side of Puget Sound, one of these connecting with the branch railroad to Port Townsend and Port Angeles, and another serving the Puget Sound navy yard at Bremerton.

Along the two thousand or more miles of shoreline on Puget Sound and the freshwater lakes connected with it by the recent building of the Lake Washington canal, on Grays Harbor and Willapa Bay, and on the banks of the Columbia and a number of smaller rivers, may be found many ideal sites for mills and factories where deep water vessels can load at the factory docks. Other sites are found along the banks of streams removed from the immediate advantages of tidewater, but paralleled by railroads and highways which render all the service desired by any manufacturing concern.

There are altogether about 1,200 miles of navigable stream in the state. The most important rivers besides the Columbia are the Snake, the Pend Oreille, the Okanogan, the Chehalis, the Skagit and the Snohomish. There are also several other lakes not connected in any way with the tidewater, on which regular steamers, ferries and other craft operate.

Two hundred and sixty-five steamboat companies operate boats on the inland waters of the state, some of these owning only one small craft and others running several lines of steamers provided with all the conveniences of the day.

DEVELOPMENT OF TRANSPORTATION.

The development of transportation in Washington, during the brief period since its discovery and settlement, forms one of the most interesting chapters in the history of the Northwest. Fifty years ago the only "railroad" in the state was a short stretch of wooden rails on which goods were portaged around the cascades of the Columbia. Pioneers moved their supplies by canoe and saddle or along the Sound and on the Columbia by barge and schooner. In 1875 a short railroad was built from Walla Walla to Wallula, the wooden stringers of which were covered with rawhide, but the hungry coyotes ate up the rails and put the road out of commission for the winter. In 1880 the state had less than 300 miles of railroad. In 1917 it had 7,412 miles of steam main line trackage and 1,089 miles of electric railway, while the Indian trails have been replaced by more than 40,000 miles of public roads and highways.

STEAM RAILWAYS.

In 1883 the Northern Pacific railroad reached Puget Sound via Spokane and the Yakima valley, giving the State of Washington its first rail connection with the eastern states. With its many important branches, including lines to Walla Walla, through the Big Bend country, to Grays and Willapa Harbors, to Portland and the Canadian boundary, besides many supplementary feeders, it has about 3,000 miles of track. The Great Northern enters the state at Spokane and proceeds to the Sound country by way of the Wenatchee valley. It also has many im-

portant branches, including one to Oroville via the Colville and Okanogan valleys, one to Vancouver, B. C., and another to Portland, making, with its sidetracks and feeders, about 1,800 miles over which it operates. The Chicago, Milwaukee and St. Paul crosses the wheat belt of the state from Spokane, taps the Kittitas valley, penetrates the Cascade range to the Sound, and extends from there to Grays Harbor and the Olympic peninsula. This line has altogether 1,142 miles of trackage in the state. The Oregon-Washington Railroad and Navigation Company radiates from Walla Walla to Spokane, up the Yakima valley to Yakima and down the Columbia to Portland, whence it reaches Puget Sound and Grays and Willapa Harbors, operating over about 1,500 miles of trackage. The Seattle, Portland and Spokane railway follows the north bank of the Columbia into eastern Washington and penetrates the Inland Empire as far as Spokane. The Canadian Pacific and Soo lines operate over Great Northern and Northern Pacific tracks to the Sound country and the Canadian Pacific and the Chicago, Burlington & Quincy into Spokane. It will thus be seen that in effect the State of Washington is served by seven transcontinental lines. In addition, the Grand Trunk terminus at Prince Rupert, B. C., is connected with Seattle by special steamers.

ELECTRIC RAILWAYS.

The abundance of cheap hydro-electric power has caused a rapid development in electric railway transportation and some of the steam roads are now electrifying portions of their lines. These electric systems have grown from a few miles of street railway in the larger cities to interurban systems connecting centres many miles apart. In eastern Washington Spokane is connected with all the neighboring towns, with southeast Washington and northern Idaho, while the cities of Walla Walla and North Yakima are closely linked with the tributary agricultural sections for many miles.

In western Washington, Bellingham, Everett, Seattle, Tacoma and the Harbor cities all have interurbans, and it is felt that the day is not far distant when these will be connected up with the cities of the Willamette valley and British Columbia

by electric interurban extensions, as well as by steam railroads and the other modes of transportation already existing. At present twenty electric companies operate systems totaling over 1,000 miles of trackage.

HIGHWAYS AND MOTOR VEHICLES.

Of additional importance is the motor vehicle. Hard surfaced or macadamized roads in many sections have facilitated the use of motor trucks and automobiles for freight and passenger service. This has proved especially valuable to sections of the state not yet reached by railroads and which are without the advantages of water transportation.

Twenty-three primary and secondary state highways, with a total length of 3,293 miles, built by state funds, extend to almost every part of the commonwealth. These include the Pacific highway from British Columbia south along the east shore of Puget Sound to the Columbia river, the Sunset highway from Puget Sound over the Cascades to Spokane, the Inland Empire and Central Washington highways through Eastern Washington, the McClellan Pass, via Rainier National Park, connecting with the Inland Empire at Yakima, the Olympic highway circling the Olympic peninsula, and the National Park highway from Mount Rainier to Southwestern Washington. While some of these highways are not yet entirely completed, good grades have been established and many miles of them have been graveled or hard surfaced, affording magnificent tourist routes among the beauty spots of the Northwest and commercial arteries into which pour the varied products of the state. These state highways are supplemented and fed by thousands of miles of county roads in varying stages of improvement, making a total of between 40,000 and 50,000 miles of highway in the state.

No state in the Union has taken more seriously the matter of extending its highway system and improving existing roads. A special levy is assessed in every county. At the present time from all sources an average of $7,000,000 per annum is available for road work in the state and a similar sum, according to present plans, will be available for some years to come. Part

Thirty-two cars of logs on their way to the mill where they will yield more than 300,000 board feet of lumber.

of this is spent for new highways and part for the maintenance of those already built. Large amounts are also spent annually by the federal government for roads within the national forests, and additional sums from the Post Road Aid Fund are used in co-operation with the state.

This state system of trunk roads is so arranged that its principal arteries become a part of the national thoroughfares entering the Northwest, connecting with the Evergreen Highway, the Oregon Trail, the Pacific Highway, the National Parks Highway, the Yellowstone Trail and the Canadian highways from Winnipeg and Edmonton to the Coast.

The position which the automobile has attained in Washington as a means of transportation is shown by the fact that during the ten months' period from March 1, 1917, to January 1, 1918, there were issued by the Secretary of State 100,042 licenses for motor vehicles.

WHARFAGE.

Closely connected with the subject of transportation is that of wharves and docks which occupy an important place in the commercial activity of the state owing to the large amount of traffic carried on by water. There have been reported to the Public Service Commission a total of 134 docks and wharves, some on the Columbia river, others on the harbors of the southwestern part of the state, but most of them located along Puget Sound. These range in size and importance from the tiny landing, over which passes the trade of some rural community, to the mammoth municipal and private docks of the large cities over which vast cargoes are loaded onto ocean steamers.

TELEGRAPH AND TELEPHONE.

Allied also to transportation are the express, telegraph and telephone companies, all of which are well represented in Washington, there being of telephone and telegraph wire a total of 12,843 miles. Five express, six telegraph and 162 telephone companies are in operation, thus bringing almost every section of the state into direct and immediate communication with any part of the civilized world.

CHAPTER V.

COMMERCE AND MARKETS.

Other things being equal, the growth of any section as a manufacturing district will be in proportion to its facilities for commerce and the availability of markets for its products. The strategic position of Washington, already alluded to, extends the range of possibilities for its commercial development to an almost boundless degree. Possessing many ports where "rail meets sail" on Puget Sound, Grays Harbor, Willapa Bay and the Columbia river, and being served by the great transcontinental railways, which, connecting with vessels engaged in transoceanic and coastwise trade, bring the cities of all parts of the state into direct communication with ports across the sea, it is prepared both by nature and by human accomplishments to reach out to the entire world for the interchange of raw materials and manufactured goods.

Full realization of the promised development has been interfered with temporarily on account of the European conflict beginning just at the time when great things were expected from the opening of the Panama Canal, with a result that very little benefit has as yet been derived from that, the greatest engineering feat of a century. As soon as normal shipping conditions are restored, the vast benefits from this waterway will surely be felt and regular lines of water transportation will be established between the ports of Washington and those of the Atlantic and Gulf coasts; with eastern South America as well as with the principal European markets.

Even with such handicaps, the commercial growth of Washington has been phenomenal. The commerce of the Washington port district has become the greatest on the Pacific Coast and is rapidly increasing. In 1914 the total value of the merchandise exported through the Washington customs district was $55,012,215 and of merchandise imported, $55,391,565. The corresponding figures for 1916 were of exports, $162,772,872, and of imports, $135,580,910. These figures, however, are only for such goods as are subject to duty or excise in accordance

with the United States revenue laws. More representative of what actually passed through the ports are the figures of the various port wardens. Such figures are not available except for the cities of Seattle and Tacoma. These are quoted on account of their significance to the entire state, but it should be remembered that Spokane and other eastern Washington cities are equally responsible for such business in proportion to their population or the goods which they produce or utilize.

The Seattle port warden's report shows that imports of all classes through that port for the year 1916 totaled $259,559,106, while the exports totaled $152,879,213, the entire gain in both imports and exports over 1915 being $154,645,926. This enormous total of $412,438,319, however, has been largely exceeded in 1917, and while definite figures are not available because of federal restrictions due to the war, the estimate is placed at $550,000,000 for the year. The Tacoma report for 1916 also indicated big increases over 1915, imports amounting to $105,039,748 and exports, $107,349,871, the entire gain over the previous year being $118,138,002. The trade of this port for 1917 also shows a large growth, the total value reaching almost $260,000,000, the estimated increase over 1916 being about 26 per cent. Domestic trade was carried on by water with Alaska, California, Hawaii, Baltimore, New York, and the Philippines; while foreign commerce included Australia, Africa, British Columba, Denmark, England, France, Greece, Holland, India, Ireland, Italy, Norway and the Orient (including all Asiatic countries), Scotland, Siberia, South America, Spain, the Straits Settlements, Sweden and Switzerland.

EXPECTATIONS.

With such heavy traffic under present conditions when many ports are closed to our commerce, it is encouraging to contemplate what proportions will be reached when at the close of the international conflict these ports are again thrown open; when the short route through the Panama Canal permits Pacific Coast companies easy access to the Atlantic trade; when the stupendous development in prospect for Russia and the Orient begins to

be realized; and when an awakened America has recognized the value of a merchant marine to carry the trade of the continent on all the seas.

THE WESTERN GATE.

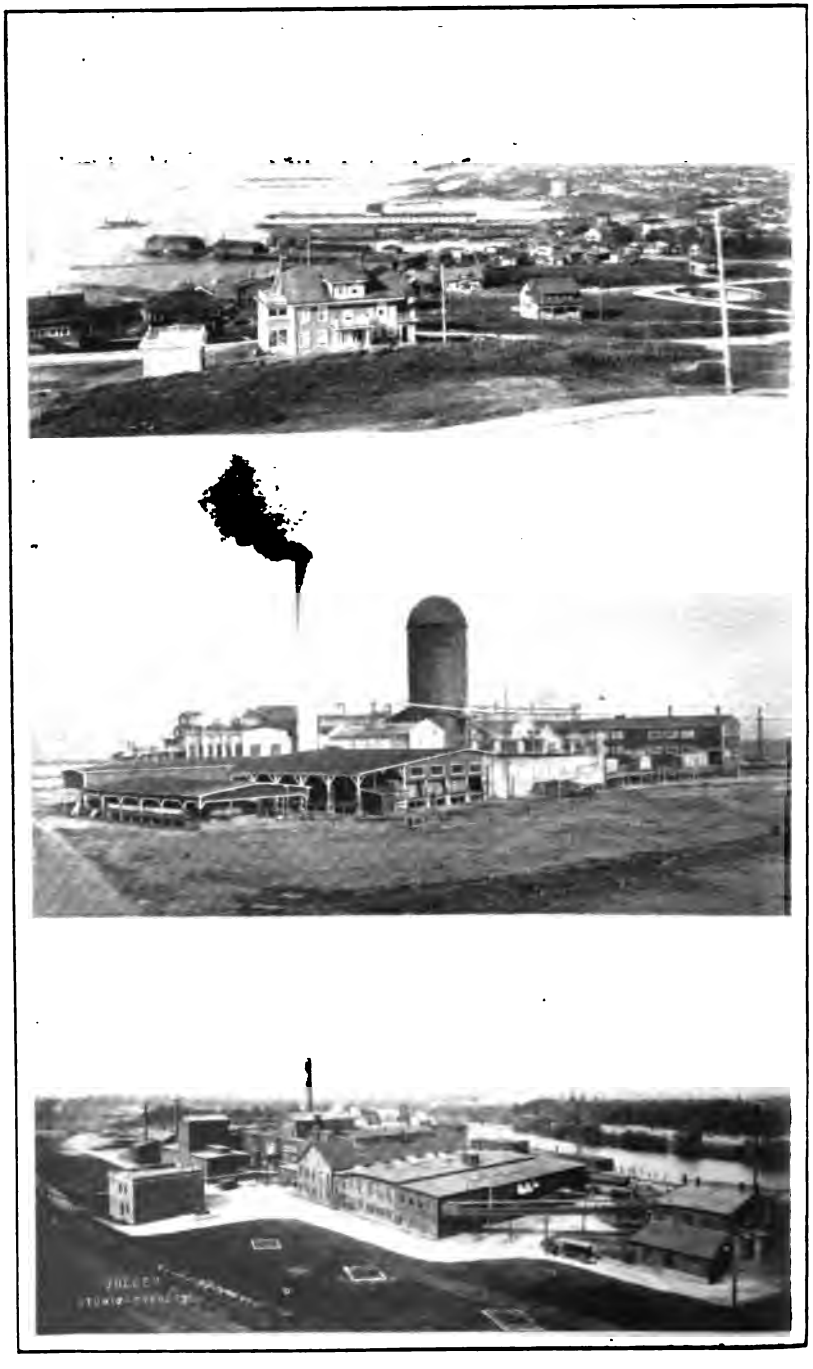
In a remarkable little book, "The Western Gate," published in 1911, Patrick H. W. Ross, the author, traces the ethnological and geographical reasons for the development of the great trade centers of the world and submits that what he styles "the Maritime District of Western Washington" is so situated as to become the greatest commercial center of the Western Hemisphere. He compares it as to location, climate, harbor facilities, and transportation possibilities, with Great Britain, and says:

"Given the chance to follow the line of least resistance, the Baltic, (*i. e.*, seafaring) race in the Western Hemisphere will make of its Baltic habitat in Washington a state as populous, as rich and as powerful in that hemisphere as England is in the Eastern Hemisphere and nothing can stop that development, once it is understood and unimpeded and encouraged by the people of the United States. The conditions for opening a great world port there are perfect beyond comparison."

THREE KINDS OF MARKETS.

Markets for the manufactured products of Washington may be considered under three heads—local, domestic and foreign. All of these are available in a greater or less degree, depending upon the nature of the product. As an example, take the case of our greatest industry, lumber. Much of the product of the mills, particularly the smaller ones, is consumed locally in the communities directly adjacent to the mills. In fact there are some mills which cut lumber only for the local trade.

Other mills maintain lumber yards in their own or adjacent cities, but dispose of most of their product in the eastern markets, shipping by rail to various points in the United States. Other mills, located along deep water, ship practically all their products to foreign countries on steamers or "windjammers" which ply between the ports of Washington and other lands. During 1916, Washington exported nearly three million dollars' worth of lumber to foreign countries. Much of this was un-



EVERETT INDUSTRIAL SCENES.

No. 1. Bay front, showing manufacturing section. No. 2. One of the largest and most modern lumber mills in the world; daily capacity, 750,000 board feet. No. 3. Everett Pulp & Paper Co.

dressed lumber and dimension timbers. In addition nearly two million dollars' worth of remanufactures or goods made out of lumber were also shipped.

Similar conditions prevail as to many other products, including condensed milk, canned fish, fruits, vegetables, flour, etc., certain portions of all of which are consumed locally and much more shipped to distant markets outside the state.

LOCAL MARKETS.

Then there are some lines of manufacturing whose products are no more than enough to supply the local markets and in many cases insufficient, so that many goods must be shipped in to supplement the Washington made goods; for it must be remembered that this state is comparatively new and a rapid growth is taking place. Many new immigrants make their homes here each year and those already located are rapidly improving their own financial circumstances and increasing their demands for additional articles of various kinds. Modern methods of farming, clearing of logged-off lands, the opening of large areas to irrigation, and the development in mining and fishing are all important contributing influences toward the rapid upbuilding of local markets for the goods of our own manufacturers. On the other hand, these same forces increase the supply of raw material for existing and new industrial plants.

DOMESTIC MARKETS.

Domestic markets, of course, are markets under the flag of the United States. These include all the United States proper, Alaska, Bering Sea, Hawaii and the Philippines. Of the neighboring markets, Alaska is at present by far the most important to the State of Washington. A special chapter is devoted to its discussion; but it is pertinent to note here that Washington is not just the gateway to Alaska; this Empire of the North depends on Washington for many of its supplies and a large part of its trade has been directly with the industrial plants and jobbing houses of this state.

Many classes of manufactures, particularly lumber and dairy and other agricultural products, are afforded a good market in the middle and eastern sections of the United States. A very large proportion of the lumber and shingles produced in Washington is marketed throughout the central states and much of the condensed milk, canned fish, fruits and vegetables also finds its way to these sections. Flour and grain products from Spokane, Walla Walla, Yakima and other eastern Washington cities are largely shipped by rail to the great eastern markets, but detailed figures on rail shipments are not obtainable.

Some idea of the present domestic commerce of the Northwest by water may be gathered from the following items of export through the port of Seattle, for 1916, bearing in mind that proportionate shipments were also made from Tacoma, Everett and Bellingham, as well as other smaller cities on the Sound and Harbors, and that much of this originated in Spokane, Yakima, Walla Walla and other east of the mountain sections:

	Butter	Cheese	Canned Milk	Flour
Alaska	$369,820	$64,832	$304,549	$229,369
Bering	114,512	17,179	93,546	120,987
California	9,000	26,400	1,194,425	2,898,686
Hawaii			53,212	120,286
Philippines			38,387	478,618
Totals	$493,332	$108,411	$1,684,119	$3,842,946

The larger part of the above items, besides numerous other varied products, was presumably produced in this state. In addition, many goods not extensively manufactured in the state, if at all, are also shipped from Washington ports; such as hardware, machinery, nails, paper, rubber goods, structural steel, explosives, etc. The total volume of domestic commerce passing through the same city by water in 1916 was as follows: Alaska, imports, $36,169,415, exports, $21,930,038; Bering Sea, exports, $3,706,846; California, imports, $33,227,770, exports, $13,275,573; fishing banks, imports, $1,303,287; Hawaii, imports, $649,672, exports, $1,063,447; Philippines, imports, $8,858,151, exports, $2,384,536; local points, imports, $17,046,598, exports, $14,339,466. Tacoma, Everett and Bellingham

also handled large volumes of this business for which segregated figures are not available.

FOREIGN MARKETS.

Unnatural conditions throughout the world have probably affected our foreign trade more than any other branch of our commerce, so that it is difficult to present any conclusive data of recent origin on the subject, since our principal foreign markets at present are confined chiefly to trans-Pacific lands. These

Rice in transit (through a Tacoma warehouse).

markets, to be sure, are very important and will rapidly increase in importance, since they belong to countries which, like the Northwest, are just beginning to be developed. Washington is so situated that it should derive the greatest benefit from the vast amount of commerce which will result. Its ports, by the great circle method of navigation, are nearer to Siberia, Japan and China than are any other American cities. Already Japan is a large consumer of American-made goods, and an awakened China is calling for a constantly increasing quantity of Occi-

dental improvements and, with her enormous population, offers a remarkable field for commercial effort. The vast plains of Siberia have possibilities of a development similar to that of our own West; when political upheavals have subsided and a liberal governmental policy opens it to settlement and intensive cultivation, it will become one of the principal markets for American products.

Then, too, other Asiatic ports, Australia, South American countries and British Columbia are all reached more readily from Pacific Coast ports than from either the Atlantic seaboard or European continent. One of the works being taken up by commerce and trade bureaus is the study of such trade and the ways in which we can best prepare for it. When the future value of all this is fully realized it may be readily understood why the chances for Washington ports and consequently for Washington-made goods are so favorable.

STATISTICS OF FOREIGN TRADE.

The rapidity with which the commerce of America with Asiatic countries has grown during the past two years can be seen from the report of the U. S. Bureau of Commerce. In the first ten months of the fiscal year of 1915, the total exports to Asia were $91,259,248; imports from Asia, $201,355,226. During the same period for 1917, the exports were $324,230,432, while the imports were $465,219,192. In this, two things are conspicuous, the large increase in the total commerce with Asia and the increase in the ratio which the exports bear to the imports.

As an indication of what the foreign trade has amounted to during the past year, figures are again quoted from the report of Seattle's port warden, the same ratio probably existing in the business of the other ports: Australia, imports, $8,079, exports, $121,645; British Columbia, imports, $12,795,152, exports, $6,092,123; England, imports, $77,207, exports, $3,180,575; India, imports, $3,689,992, exports, $74,466; the Orient, imports, $117,040,771, exports, $39,991,660; Siberia, imports, $711,880, exports, $44,667,886; South America, imports, $144,276, exports, $826,638; Straits Settlements, imports, $26,659,465, exports, $1,002,526.

Of these figures, those showing our exports to Siberia and to South America seem especially significant, the former as illustrating the magnitude of the trade already developed with this vast region which offers such a profitable field for the future, and the latter as showing how little is being done in the Northwest to gain the trade of the Latin nations of the southern continent. Of the total to South America, nearly $700,000 was for wheat, rice and flour, leaving only a little more than $100,000 worth of manufactured goods. On the other hand, most of the largest items representing trade with Siberia were for manufactured goods, including autos, box cars, dry goods, explosives, leather products, machinery, rubber goods, saddlery and twine, each of which ran to more than one million dollars.

TRADE IN TRANSIT.

Many opportunities for the manufacturer are revealed by the quantities and varieties of exports and imports passing through our ports. Naturally much of the exported merchandise does not originate in the State of Washington, but is shipped to our ports by rail from many widely separated points. The same is true as to the destination of the imports.

In the case of many articles, the query arises, why could not the manufacturing be done as cheaply here near the seaboard, and the long, transcontinental haul be thus saved. For instance, more than twenty-one million dollars' worth of crude rubber was imported last year through two ports, while nearly a half million dollars' worth of rubber goods was exported through the same ports. This does not include the amount consumed on this coast. On all of this, freight had to be paid two ways across the continent.

More than $700,000 worth of boots and shoes were shipped from one Washington city last year, and yet only a small portion of them were manufactured in this state, although more than $2,000,000 worth of hides passed through this same city. Nearly a million dollars' worth of wool was imported through Seattle and fully as much woolen goods and garments was exported through the same port. Seven million dollars' worth of block tin was imported from Asia by way of one Washington port and shipped by rail to Pittsburgh or other eastern points.

where it was rolled and shipped back to this coast in enormous quantities, more than $3,000,000 worth of tin plate having been exported over Washington docks.

Many similar instances might be cited where raw material actually passes through local ports en route to the manufacturing centers of the East, while the finished products are hauled back across the continent and shipped to foreign ports or sold in the markets of Alaska and the western states.

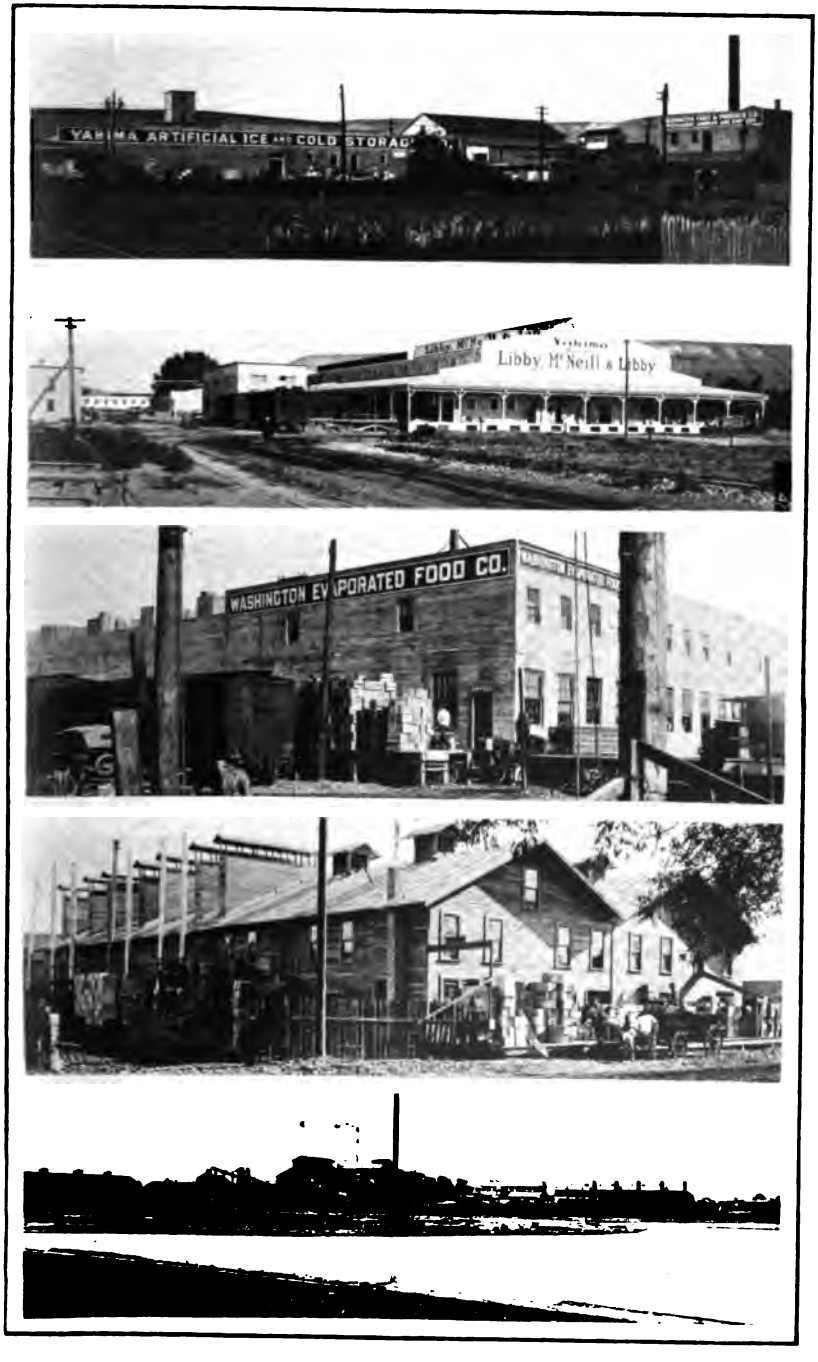
It would surely pay the manufacturer of such articles as these mentioned, as well as of many others, to investigate still further the trade conditions that make such long freight hauls necessary in order to supply certain sections with the articles they need. Many of these could be just as well manufactured in Washington and the amount saved in freight would be of great help in bidding for the markets demanding such articles.

OPPORTUNITIES FOR BUILDING UP TRADE.

Washington manufacturers do not have to depend on the unsolicited demand for their goods. Splendid chances exist for building up markets, both domestic and foreign. One way is by using every possible care in the packing of goods for shipment. It is stated that one reason for our splendid trade with Alaska lies in the fact that our merchants have eagerly met the demands of the market. Attempts to rob them of this trade have been defeated in a great measure because merchants elsewhere have not taken the same pains to cater to it. For example, all goods destined for Alaska, particularly for points in the interior, "are packed with special reference to the distances to be traversed, the numerous handlings which must be had and the means of transportation generally."

CAREFUL SHIPPING IMPORTANT.

The experiences with Alaska should be taken into consideration by manufacturers who aspire to the trade of China, Russia, South America and other districts, foreign or domestic. The consular reports from various countries record many complaints against careless packing and the independent attitude of American supply houses, and show also that Germany and England have been able to retain the South American trade



INDUSTRIES AT YAKIMA.

No. 1. A $75,000 ice and cold storage Plant. No. 2. A $185,000 cannery. No. 3. Fruit and vegetable evaporator. No. 4. Apple evaporator. No. 5. A $400,000 lumber mill with 35,000,000 feet annual capacity.

during the past principally because of the indifference of American manufacturers, who too often have assumed the attitude that if foreign customers did not want the kind of goods they made, shipped as they wanted to ship them and packed "any old way" they didn't have to take them.

A careful study of the particular demands of such export markets will result in the development of a vast volume of commerce for the industries of the state. Foreign peculiarities must be taken into consideration and the need of meeting their peculiar requirements cannot be too strongly emphasized. Special conditions of transportation, climate, etc., must be studied by the manufacturers who wish to derive the full advantages of these foreign markets. But in the end such efforts will surely pay well.

JOBBING CENTRES.

Wholesale distribution is one of the factors also to be considered by many manufacturers who do not sell direct to the consumer or retailer. In this instance, too, Washington offers excellent facilities. The cities of Seattle and Tacoma in western Washington and Spokane in eastern Washington, besides Portland, Oregon, which for practical purposes serves much of the State of Washington equally with Oregon, are large jobbing and wholesale centres; while Walla Walla, Yakima, Wenatchee, Bellingham, Everett and Grays Harbor are smaller distributing points of considerable importance. Retail stores carrying all lines of goods are well represented in every city and town, so that local distribution offers few difficulties.

READY MARKETS.

Taken as a whole there are few sections in the United States where the market facilities offered to manufacturing industries equal those of Washington. While it is true that every variety of manufactured product is subject to its own peculiar difficulties of marketing, so that no general or limited discussion can be expected to provide specific information or point out the best means of disposing of any particular product, nevertheless, prospective manufacturers may feel assured that in this state they will find such conditions exceptionally favorable and readily adaptable to the individual needs of every establishment.

CHAPTER VI.

ALASKA'S RESOURCES.

BY J. L. McPHERSON,
Manager of Alaska Bureau, Seattle Chamber of Commerce and Commercial Club.

Alaska, equal in area to twelve states the size of New York, offers to Washington and the Northwest a trade territory that has no equal. It probably possesses a greater variety of natural resources than any like area of our land. These embrace mineral deposits of gold, silver, copper, iron, tin, antimony, tungsten, lead, graphite, cinnabar, platinum, molybdenum, marble, gypsum, barytes, and coal and oil; the most extensive fishing banks in the world; a fur industry, land and aquatic, that has produced over $76,000,000; kelp fields of great extent; agricultural and grazing lands of an estimated area of 100,000 square miles; enormous areas of reindeer pasture land and a large supply of timber suitable for aeroplane frames and paper pulp products; a water-power that insures a great industrial development; and scenery, unsurpassed, that will make the northland a tourist Mecca.

AREA, POPULATION, AND COMMERCE.

This land of great resources, of inestimable wealth, is situated in the same latitude as Norway, Sweden and Finland. Climatic conditions are similar. It has an area a third greater than these three European countries, which have a population of about eleven millions and can in no wise compare with Alaska in variety, extent, or value of resources. Alaska's population is only about 75,000, probably not to exceed 50,000 of whom are whites. Its commerce in 1916 reached a total value of $110,368,592. No country in the world's history has ever made such a showing, which is all the more remarkable because it has been limited, with few exceptions, to those regions that can be reached by water transportation. Its greater development awaits the construction of the necessary railroads and wagon roads that will open up the vast hinterland of the interior. With

such facilities there will come about a progress in development that will be unequalled by any other land.

GOLD PLACERS.

Gold placers have been found throughout all sections of the north and had produced by the end of 1916, $196,800,000. The wide distribution of these deposits assures a great gold quartz industry which, until the present time, with one or two minor exceptions, has been confined to the deposits adjacent to tide-

Alaska's area equals one-fifth that of continental United States or 12 times the state of New York. It would reach from the coast of Georgia to the California coast and from the Dominion of Canada to the Mexican border.

water. The Treadwell mines have produced in excess of $56,000,000 and in the same belt are two other mammoth producers, the Alaska-Gastineau and Alaska-Juneau, which are today mining and milling over 9,000 tons of ore daily, with ore resources blocked out that assure operations for many years. These mines have established the world's record for low cost of mining and milling; the total cost per ton at the Alaska-Gastineau mine for 1916 being only 73 cents, mining operations in this belt having been reduced to a basis of cost attained only in manufacture.

COPPER.

The great extent of Alaska's copper deposits cannot be estimated. During 1916, eighteen copper mines were operating, situated in three widely separated belts, Prince of Wales island in southeastern Alaska, Prince William sound in southern Alaska, and Chitina in the Copper river interior. These mines in 1916 produced 135,289,219 pounds of copper valued at $35,314,993. The great Kennecott mine in the Chitina district produced over 120,000,000 pounds, ranking fourth in production among the world's copper mines and first in low cost of production; the Kennecott cost of production being only 4¾ cents per pound as compared with 7 cents for Utah and 11 cents for Calumet and Hecla.

ANTIMONY, IRON, AND MARBLE.

The mining of antimony, commenced in 1915, has produced $253,635, and tungsten mining, commenced in 1916, had a value for that year of $83,370.

Large deposits of iron ores have been discovered, deposits of magnatite in southeastern Alaska, hemetite on the Seward peninsula and chrome ore on Kenai peninsula. Extensive deposits of graphite are under development in the Seward peninsula region. Deposits of lead and silver ore are being developed in southeastern Alaska. A deposit of cinnabar has been mined on the Kuskokwim. Platinum, molybdenum and other valuable metals have been discovered in various regions.

The marble deposits of southeastern Alaska are now furnishing the marble used in the construction of buildings throughout the western cities. These deposits are stated to rival both in extent and quality the famous marble deposits of Vermont. Gypsum, used for plaster of Paris and as a land fertilizer, is being mined on Chichagof island. Barytes, used in the production of white lead, is being mined on Prince of Wales island.

COAL AND OIL.

The coal deposits of Alaska range in quality from lignite to anthracite and have been estimated by the U. S. Geological Sur-

vey to embrace a greater tonnage than originally contained in the state of Pennsylvania. The semi-bituminous coal of Alaska is the most suitable coal for steaming purposes to be found in any country bordering on the Pacific. Until recently, the mining of Alaska coal has been prohibited. A leasing law is now in effect which provides for the development of this industry on which depends in great part the industrial development of Alaska.

Oil has been discovered in three widely separated belts, but as was the case of the coal deposits, all development is prohibited. The Yakataga-Katalla belt extends for a distance of over a hundred miles. The oil in this belt is of a paraffine base and before the order of government withdrawal had gone into effect, title to one claim had been granted. The production from the wells on this claim is being refined on the ground and the output disposed of in the nearby communities of Cordova, Valdez, Seward and Anchorage.

FISHERIES AND FURS.

The fishing industry of Alaska exceeds in value of output all of our Pacific Coast states combined and yet the development of this industry can be said to have only commenced. It has been stated by the U. S. Bureau of Fisheries that there are in Alaskan waters approximately 250 varieties of food fish. It is estimated that the value of this industry for the year 1917 will exceed $40,000,000. The continental shelf, extending around the entire shore of southeastern, southern and western Alaska, is probably the greatest fishing ground possessed by any country.

The prohibition by the government of the killing of fur seal is resulting in a gradual increase in the number of the seal which annually visit the Pribilof islands. The seal are now estimated to exceed 350,000, but the protective measures now being enforced will result in building up the herds to something like their former numbers, which at one time was estimated to total approximately five million.

The gradual decline in the land fur industry will in time be overcome through the development of the domestic fur industry.

Famous Kennicott copper mine, Alaska. Much of the wealth of this rich territory flows through Washington's trade channels.

Many fur farms have been established throughout the northland for the raising of fox and other fur bearing animals.

AGRICULTURE.

The agricultural possibilities of Alaska are probably greater than those of the combined Scandinavian countries. It is estimated that Alaska contains 100,000 square miles of land suitable for cultivation or grazing, when cleared. This is an area equal to two times that of the state of New York. Of this probably 15,000 to 20,000 square miles are suitable for intensive cultivation.

REINDEER.

The herds of reindeer in Alaska now number in excess of 90,000 head. This industry was started in the years 1897 to 1902 by the importation of 1,280 reindeer from Siberia. The reindeer grazing lands of Alaska, which are situated in the western and northern parts of Alaska, are unsuitable for agricultural development and are estimated to provide pasturage for at least ten million reindeer. The raising of reindeer, both as a source of food supply and for various by-products, promises to become a large and valuable industry.

SPRUCE TIMBER.

Alaska spruce is now being extensively used in the manufacture of aeroplane frames, for which purpose it is pronounced the most suitable timber available. The use of this timber also for paper pulp products assures a large and valuable industry. It is estimated that the forests of southeastern and southern Alaska contain in excess of eighty billion feet of merchantable timber. The amount suitable for paper pulp purposes is probably far greater.

RELATION TO WASHINGTON.

The State of Washington is the gateway to this great Land of the North and can rightfully be expected to supply many of the demands of its growing population and to receive in return from the rich natural resources of this territory, many of the raw materials required for its industrial development.

CHAPTER VII.

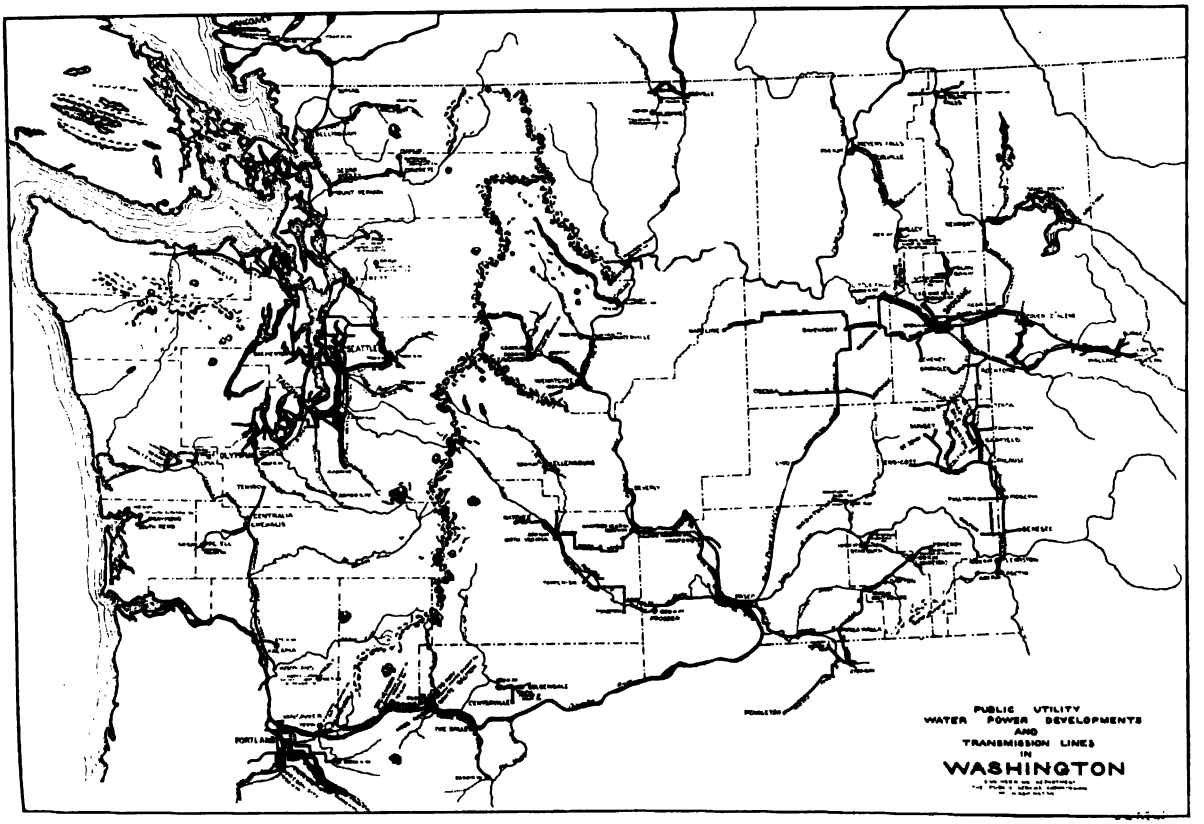
WATER POWERS IN THE STATE OF WASHINGTON.

BY W. E. HERRING,
Industrial Agent, Puget Sound Traction, Light & Power Company.

The relation of power to manufacturing is as the engine to a freight train. Without it all other elements are of no avail. It is important too for practical purposes that it be abundant and cheap. The sources of the cheapest available power thus far known to the world are the falls and rapids of the rivers and mountain streams. In these Washington is richly endowed, for it has more undeveloped water power within its boundaries than any other state in the Union. Government figures as to the minimum potential power in the United States show a total of 26,736,000 horse power, and of this amount 4,932,000 horse power is available within the State of Washington. The state ranking next to Washington in this respect is Oregon, where 3,278,546 horse power is available, so that nearly a third of all the potential water power in the United States is in the two states, Washington and Oregon.

NATURAL CONDITIONS FAVOR VAST POTENTIAL POWER

The natural causes for such vast quantities of available power are the heavy precipitation and rapid fall in the streams entering the ocean on the one hand and the extensive area drained by one of the largest rivers on the continent, and its tributaries on the other. The precipitation in the Olympics and on the west slope of the Cascade mountains averages 90 to 100 inches per annum, which, coupled with numerous falls, affords many almost ideal opportunities for water power plants. On the east side, the mighty Columbia river along with several important tributaries carries the drainage of a territory five times that of the entire State of Washington, and in the heavy flow of water over cataracts, falls and rapids brings the total of available water power on the east side almost up to that produced by the higher and more frequent falls of the west side.



Existing hydro-electric plants and lines over which 300,000 H. P. is distributed.

IMPORTANT RIVERS.

Among the most important rivers in addition to the Columbia having potential water power are the Spokane, the Snake, the Pend Oreille, the Methow, the Chelan, Yakima, Wenatchee and Klickitat on the east side, and the Skagit, Stillaguamish, Skykomish, Snoqualmie, Cedar, White, Puyallup, Nisqually, Skokomish, Elwah, White Salmon, Lewis, Toutle and Cowlitz on the west side.

DEVELOPED POWER.

While the electrical industry as a whole is increasing at a tremendous rate in various parts of the country, the Pacific Coast has experienced a greater increase in water power development within the last few years than any other section. Yet of all the vast potential power, the total amount developed in Washington is now only slightly over 300,000 horse power. Conditions are rapidly changing, however. Since many new industries have sprung up during the past twelve months and many more are now being established, it has become necessary to increase also the amount of power available.

LARGEST POWER COMPANIES.

The Puget Sound region, embracing that portion of the western part of the state extending from Olympia to the British Columbia line, a distance of approximately 175 miles, is covered by the transmission lines of the Puget Sound Traction, Light and Power Company, with total assets of approximately eighty million dollars and with approximately 151,000 horse power installed in its various plants. The next largest company is the Washington Water Power Company of Spokane with a total installed capacity of 108,250 horse power. The Pacific Power and Light Company with plants scattered through the Columbia river basin has a total installed capacity of 22,100 horse power and supplies the entire Columbia river territory, extending almost to the eastern limits of the State of Washington. On the west side of the mountains and extending southerly from Olympia to the Columbia river is the North Coast Power Company with a total rated capacity of 3,087 horse power.

SMALLER POWER COMPANIES.

Throughout the balance of the state are numerous smaller plants which practically supply the needs of every small community in the state.

The following are the larger plants of this type:

NAME	Territory Served	K. W. Rating of Generators
Lewiston-Clarkston Improvement Company	Asotin	1,900
Northern Washington Power and Reduction Co.	Republic	675
Hanford Irrigation & Power Company	Columbia River Valley	1,800
Okanogan Valley Power Company	Methow River	630
Olympia Light & Power Company	Olympia	1,000
Olympic Power Company	Port Angeles	6,000
Wenatchee Valley Gas & Electric Company	Wenatchee	1,180

In addition, the Great Northern Railway has a 6,000-kilowatt development on the Wenatchee river, all of which is used in operating their trains through the Cascade tunnel, which was electrified about nine years ago.

The Superior Portland Cement Company has approximately 1,500 kilowatts which it uses in its cement plant and the Inland Portland Cement Company has 3,500 kilowatts, all of which is used in the manufacture of cement.

COST OF ELECTRICITY IN WASHINGTON.

The cost of electricity to the consumer is less in Washington than in any other part of the United States. That it is so can readily be understood when it is known that the electric companies are selling current even to coal mines and to lumber mills for their entire operation.

Coal is mined in several parts of the state and there are numerous producing mines within a few miles of tidewater. Competition with cheap coal from these mines and with lumber refuse from the mills has had to be overcome. In the lumber mills the only practical way of getting rid of the refuse is by burning and so it has been the practice for the larger mills, in order to utilize some of this, to generate their own power. While in the past, steam drive in the lumber mill, transmitted by means of pulleys, belts and shafting, was considered the proper thing, more modern practice dictates that freedom from

fire, increase in efficiency and better results can be obtained by electric drive. Hence, many of the more modern mills have adopted this type of drive.

Comparative figures obtained from users of large blocks of power in various places have shown that the rates made in this section are materially lower than elsewhere. This condition will unquestionably have an influence in inducing large users of

Tacoma's Nisqually power plant dam at intake.

power to locate in this territory. It is realized, to be sure, that in the majority of industries the cost of the power used represents a very small percentage of the cost of the finished product; but in those selected industries where the cost of power amounts to from 40 to 60 per cent. of the cost of the finished product, the matter of power rates is a very important one.

HISTORY OF POWER DEVELOPMENT.

The growth of the Pacific Coast states is so well known that not more than passing mention need be made of it. In the ten

years from 1900 to 1910, the ever increasing demand for electric power could not be met by the operating companies. They were compelled to increase the size of their existing plants, construct new plants and even resort to the construction of steam plants to supply the demand made upon them.

The earlier types of construction for water power plants are not the recognized standard of construction at the present day, but at that time they fulfilled the purpose admirably, with certain exceptions which are now so well known. Lack of storage facilities was one of the common causes of inability to supply the constantly increasing demand for electric power and this was overcome in some measure by the construction of steam auxiliary plants to tide over the peak period. The later hydro-electric developments, however, provide for ample storage facilities which will obviate to a great extent these steam relays; particularly is this true where more than one water power plant feeds into a common transmission line. With only one such plant the steam relay is needed to guarantee continuity of service, but with several water plants it is not so essential. As a result of this earlier development, large and expensive steam auxiliary plants were provided, which with some of the companies are now practically a dead investment, so far as their revenue producing capacity is concerned; as a measure, however, of guaranteed continuity of service they are worth the money invested.

INCREASING CAPACITY.

Up to perhaps 1910 the operating companies had much difficulty in obtaining the capacity needed for the demand upon their plants. By the spring of 1916 conditions had changed to a certain extent and the markets had become more nearly saturated with power, while no new demands of any magnitude existed. Forecast curves made as late as 1910 by various operating companies showed an average annual increment that seemed to prove that much greater capacities would be needed in the next few years. Now, it is not possible for a public utility company to wait until the demand for power arises before constructing its plant; it is necessary to look ahead a few

years and estimate as closely as possible the power that will be required and provide that capacity before the time arrives. Following this procedure, the various companies provided additional capacities and made arrangements for new plants to take care of the load which they expected to have in the succeeding years, but up to the spring of 1916, due to the fact that these curves did not follow their upward trend, but flattened out, practically all these companies found that they had a surplus of power. Since the spring of 1916, however, especially in the western part of the state, a large number of new industries, particularly shipbuilding plants, have been constructed which required an enormous amount of additional power so that the company operating in this territory is now compelled to increase its capacity by 35,000 horse power in order to take care of the rapidly growing load.

AN IMPORTANT COMPARISON.

As a matter of information, statistics show that one-fourth of the entire generating capacity of the United States is used by one-seventeenth of the country's population here in the West and that this same population is contributing one-seventh of the aggregate income of the electric lighting industry. On an average, every person in the West uses 527 kilowatt hours annually and pays $7.50 for light and power as compared to the 99 kilowatt hour consumption and the $3.00 contribution of the population east of the Rockies.

One explanation for this lies in the fact that public utility companies in this state as elsewhere recognize the interdependence of the industries and the companies which serve them; so it behooves them to use every effort to utilize every advantage which abundant water power can offer, in order that they may be in a position to supply plenty of electrical energy at a minimum cost to the consumer.

Thus it is clear that to whatever extent manufacturing depends upon cheap power, this state is well fortified not alone in potential water power, but in the amount developed and available or in process of development.

Power plant at Little Falls. Electrical power generated here is carried to Spokane and distributed for city lighting, street car service, manufacturing and domestic use.

CHAPTER VIII.

SOME APPLICATIONS FOR CHEAP POWER.

The abundant power described in the foregoing article is susceptible of many important industrial applications in addition to those already being made by existing factories in this state. The comparatively new fields of electro-metallurgy and electro-chemistry afford a great variety of operations.

Among the electro-chemical processes now known and which could probably be carried on successfully in Washington are electro-alkaline manufacture, by which chlorine, caustic soda, hydrogen and sodium-hypochlorate are produced; various nitrogen fixation processes, by which nitrogen is extracted from the air and manufactured into nitric acid, commercial fertilizer or other products; and the production by means of electric furnaces of such materials as silicon, peroxides, metallic magnesium, metallic phosphorus, or such artificial abrasives as carborundum, alundum, aloxite or crystolon.

Discussing this phase of electrical development, C. E. Bogardus, a prominent chemical engineer of Seattle, says:

"Electricity is at present a dominating factor in the metallurgical field. It is responsible for the commercial use of aluminum and the electrolytic deposition of zinc on a commercial scale has also been accomplished. In tin, electricity is being used two ways, electric smelting and electrolytic refining. But the electric furnace has made its greatest achievement in the production of some of the rarer base metals and making them available for commercial use where they were not used before, making possible molybdenum steel, vanadium and tungsten. It has been the ambition of the electro-metallurgist to replace the blast and crucible furnaces with the electric for the production of pig iron and steel.

"With the use of the electric current a proven success in the chemical world and a strong factor metallurgically, it follows that this work will be done where there is abundant water power with natural resources. Washington, I think I can safely state, will furnish more water power for hydro-electric purposes and cheaper than any other place in the United States.

"Many manufacturers who use electricity have their eyes on Washington and as soon as the war is over and the money market adjusted, will locate here. A great many are negotiating at present. One large company which has found a big alundite property, is planning to build in Washington and manufacture aluminum and make potassium sulphate for fertilizer. Then Niagara will not be the only center for aluminum. Niagara has been called 'the laboratory of the country.' Washington will be called the factory.

"At a not very distant date you will see in Washington electric iron and tin smelters which will supply all the iron, steel and sheet tin for the Pacific Coast and the Orient. You will see a large electric copper smelter and refining works, also nitrogen fixation plants for nitric acid and cyanimide and other chemical plants using electricity. In fact, Washington will be the greatest state in the Union in electro-chemistry and electro-metallurgy."

Some of the special opportunities which exist for manufacturing plants using hydro-electric power are indicated in the following quotation from a letter written by G. E. Gates, Spokane resident agent of the General Electric Company. Although these words have special reference to the Spokane country, much said would naturally apply to any part of the state in which cheap power exists:

"It has always occurred to me that the Inland Empire is in a position to offer great inducements to any manufacturing industry in which the process is such that the demand for power will be large and the per cent. paid for power as compared with the other manufacturing costs will be found to be high, such, for instance, as the manufacture of ground wood pulp; the manufacture of electrolytic zinc and other electro-chemical processes, such as ferro-alloys, etc.

"In the manufacture of ground wood pulp, power, which is a very large item in the manufacturing expense, is being purchased and can be purchased at reasonably low rates, especially when provisions can be made for manufacturing in what is known as 'off peak load' of the power company—the requirements of this being ample storage facilities for ground wood pulp so as to carry over the period of peak loads of the power company when the grinding could not be carried on. In addition to this we have, immediately tributary to Spokane, several varieties of wood, which it has been proven by actual results, are well adapted to the manufacture of ground wood pulp.

"Spokane is located centrally for large zinc producing districts such as are found in southern British Columbia and the Coeur d'Alene mines, and by operating a customs electrolytic precipitation plant in or near Spokane and adjacent to one of the large hydro-electric developments or possible hydro-electric developments, the precipitation plant could call on zinc from a number of sources. The electrolytic process is a comparatively new one, but has now been in operation on an extensive scale for a sufficient length of time in such cities as Trail, Anaconda and others, to prove its success.

"With the large supply of both lead ores and pig lead which is available in this district there should be a field for the manufacture of arsenate of lead, for which there is a large demand locally.

"In the fixation of nitrates, large amounts of power are required and the success of the commercial fixation of nitrates is dependent solely upon power being available at a reasonable rate. Unlimited power is available in the Inland Empire and can be furnished at a reasonable rate. Furthermore, the Inland Empire is located far from the seaboard so that a site for a nitrate plant should appeal to the government from a militaristic standpoint and being located in a large agricultural district the product of such a plant should find a ready market for commercial purposes."

Nitrogen fixation plant at La Grande, utilizing surplus current from Tacoma's municipal power system.

CHAPTER IX.

LUMBER—ITS MANUFACTURE AND RE-MANUFACTURE.

Timber ranks first among the present natural resources of Washington. From the snow-tipped summits of the Cascade Mountains to the wave-lapped shores of Puget Sound and the Pacific Ocean, there once stretched an unbroken belt of the world's most wonderful forest, while down the east slope of these mountains and eastward across the northern counties, a lighter growth of good timber extended. The inroads of agriculture and the birth of cities with their commercial aspirations have caused the clearing of a considerable portion of this area, but there still remains the largest body of standing timber in any state except Oregon. The giant firs and feathery cedars of the west side and the murmuring pines of the east side lift their heads high into the azure sky and offer material for the state's most extensive industries.

COMPARATIVE FIGURES.

The unlimited resources and the exceptional facilities for logging and transportation of the logs to the mills, which the many waterways of this state afford, have caused the timber business to be developed with such remarkable rapidity that Washington now leads the world in the production of lumber, which commodity forms its most important article of manufacture and commerce. In one year alone its sawmills cut 5,105,925,000 feet of lumber and its shingle mills manufactured 9,370,750,000 shingles. For the past ten years its annual cut has averaged about four billion feet, board measure. Its shingle output is about three-fifths that of the entire United States and its stand of red cedar is more than that of all the rest of the Pacific Northwest.

In 1914 there were 821 saw and shingle mills employing 36,461 men and producing lumber valued at $78,130,000 per annum. These mills range in size from small local plants employing perhaps a half dozen men and cutting a limited amount of rough lumber for local use, to plants employing four or five hundred men. Some of these largest mills have a daily capacity

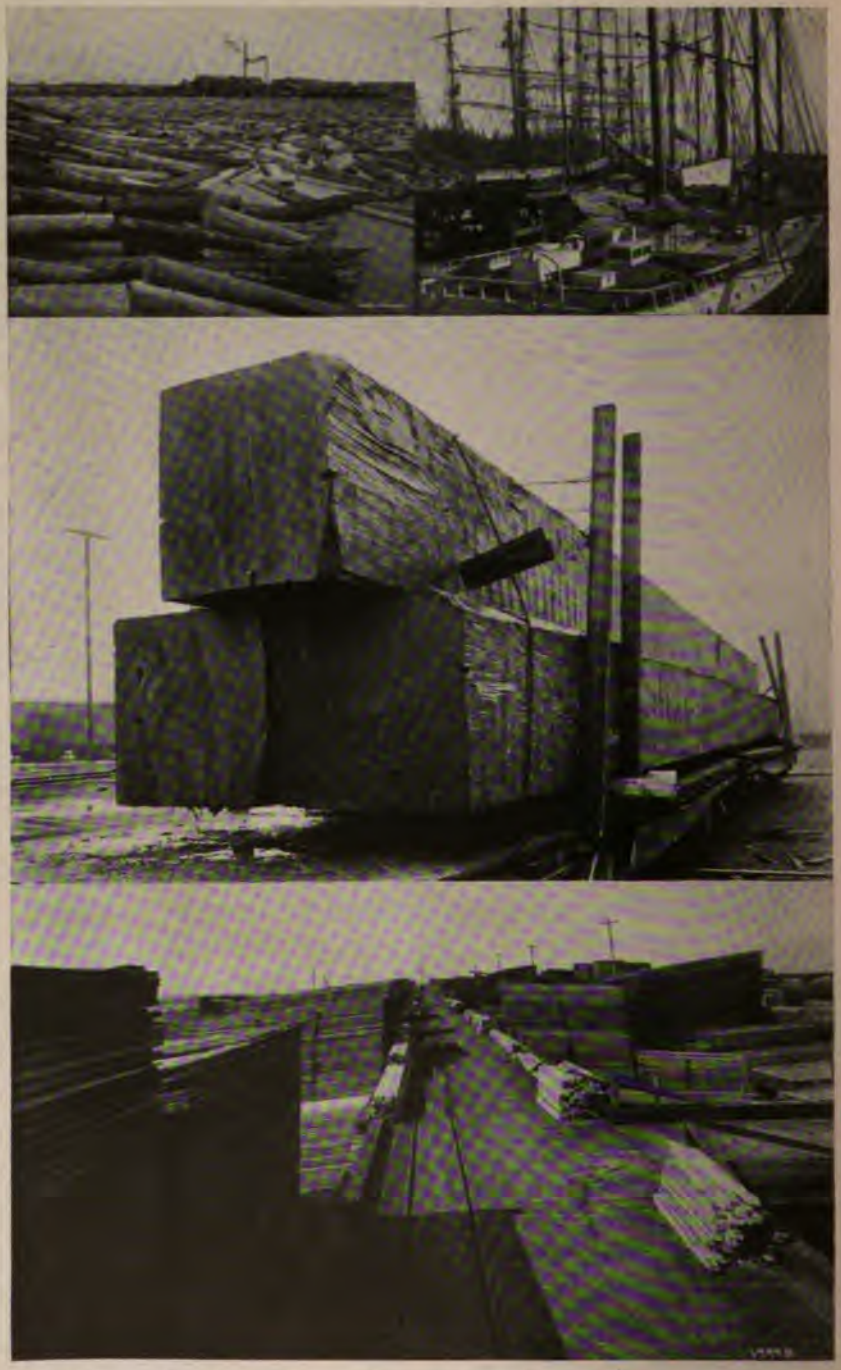
of between 300,000 and a million feet. The warehouses for some of these largest hold from 20,000,000 to 50,000,000 board feet. It is interesting to note that an eastern company desiring 4,-000,000 feet of lumber within 30 days found a Grays Harbor firm the only one in the United States that could fill the order on such short notice. Four days after it was given, a special train of 29 cars started with the first delivery of 1,000,000 feet. More than a hundred cars were required to carry the full amount.

VARIETIES OF TIMBER.

The principal varieties of trees found in Washington are the Douglas fir, cedar, hemlock, spruce and western pine. These constitute about 97 per cent. of the merchantable timber. In smaller quantities are found larch, maple, ash, alder and a few other woods of limited use. The most heavily timbered area of the state lies west of the Cascade Mountains, but there is also found in some sections of eastern Washington excellent pine and a small quantity of fir, cedar and tamarack. According to a government report for 1914, of 294.6 billion feet of privately owned timber in Washington (outside the national forests), 270.5 billion feet was growing west of the Cascades and only 24.1 billion feet east of this range. Classified as to variety, the amount of privately owned timber in the state, in billions of board feet, was as follows: Douglas fir, 193.6; white pine, 0.7; western pine, 12.5; cedar, 37.0; hemlock, 33.0; spruce, 8.9; all other species, 8.9.

DEVELOPMENT OF LUMBERING INDUSTRY.

The development of the lumber industry in this state began as a localized business with small mill companies owning and logging their own timber and supplying the demands of the community or shipping the product by water. The growth of rail transportation and the improvements in mechanical equipment have made possible larger milling operations, and concentration to a certain extent. The very nature of the industry, however, sets a limit on this concentration and the small mill not only pioneers the field but comes back after the large mill is "cut out."



WASHINGTON LEADS THE UNITED STATES IN LUMBER PRODUCTION.

No. 1. Logs in boom. No. 2. Loading lumber. No. 3. A few "toothpicks." No. 4. Graded and stored awaiting shipment.

TRANSPORTATION IMPORTANT.

Transportation facilities are particularly important in connection with the lumber industry on account of the large bulk and weight in proportion to the value of the logs and lumber. Since much of the log is waste there is a great saving in sawing it into lumber comparatively near to its point of origin. In the Puget Sound district a large amount of timber stands close to cheap water transportation, so that it can be logged and rafted at the minimum cost to any one of the numerous mills distributed along the water front. In many other sections, however, lumbering depends on moving a small mill from place to place or else transporting the logs for considerable distances to some of the larger mills.

SIX BRANCHES OF INDUSTRY.

Taken as a whole, the lumber industry comprises six more or less distinct branches, with only three of which, the second, third and last, this chapter purports to deal. These are:

(1) The ownership of the standing timber, which must often be held over considerable periods before it can be marketed.

(2) Logging, or cutting the trees into logs or bolts and delivering them to the mills, often requiring transportation over considerable distances by rail, driving or towing.

(3) Manufacturing the logs into lumber, including its seasoning, surfacing, and finishing into special forms.

(4) Wholesale lumber distribution, which bridges the gap between the sawmill and the retail lumber yard, wood-using factory or other large consumer.

(5) Retail lumber distribution, which places the bulk of the product in small lots in the hands of the consumer; and

(6) Re-manufacturing lumber and timber products into various classes of wooden goods.

LOGGING.

Standing timber, in general, is first cut and handled by the logging camps which fell the trees and work them up into sawlogs, shingle bolts, stave or heading bolts, poles, mine timbers, spars, ship-knees, piling, posts, hewn ties, and handles, excelsior

or pulp stock. In the case of most of these products, the logging camp is but the first stage in their conversion into manufactured commodities. Logs and bolts go to the mills and the other stock to the factories. Mine-timbers, poles, posts and ties may be used as they come from the camps. Ship-knees are sometimes hewed into shape, but more often dressed at the mill. Cedar bolts are sawed in shingle mills into commercial shingles and baled, ready for the market. Heading and stave bolts usually find their way directly to the cooperage plants. Other stock is worked up into handles, excelsior, or pulp and paper without any intermediate operation.

SAW MILLS.

By far the largest portion of Washington's timber passes through the saw mills and planing mills, where it is sawed, planed and trimmed into the various classes of rough and dressed lumber. In some cases the planing mill is a part of the saw mill and at other times it is a separate institution. Some of the larger mills even re-manufacture to a certain extent, but most of the lumber is sold locally or shipped in the usual commercial forms.

There are still some openings for saw and shingle mills in the state near railroad lines or spurs or waterways. One of the main considerations would be the securing of a sufficient body of timber or log supply to warrant the expense of putting in the mill, most of the timber outside the reserves and not on state lands being already in the hands of private parties who in many cases wish to saw it themselves as fast as the market demands it or capital can be secured, although often they are willing to sell to a reliable mill company. Portions of that in the reserves or on state lands is sold at intervals to the highest bidder and a certain time allowed to remove it.

The reports received as shown on page 213 indicate that fifty places are requesting saw mills and twelve desire shingle mills.

PRINCIPAL RE-MANUFACTURES.

It is quite natural that a state which produces so much timber should support many establishments which are engaged in the work of re-manufacturing some of this lumber into certain

useful and necessary articles. Yet when it is considered that there are nearly one thousand saw mills in the State of Washington, turning out annually over four billion feet of lumber valued at more than seventy-five million dollars, it will be seen that the establishments for wood re-manufacture are comparatively few. The most important ones are those that make the furnishings for houses, and other buildings. There are at present forty companies engaged in the manufacture of sash and doors, mouldings and other house furnishing articles. One of the big veneer plants in the state occupies a building a quarter of a mile long, in which 6,000 doors are manufactured each day of 22 hours—said to be a larger daily output than any other plant in the world.

A list of the products of one of the largest factories includes fir sash, fir doors, fir window frames, fir colonial columns, balusters, porch work of all kinds, stair work, paneling, inside finish, three-ply panels, furniture stock and mouldings. According to the reports on page 213 there are nine communities requesting sash and door factories. These would undoubtedly merit investigation by the interested person.

FURNITURE.

An industry which offers excellent possibilities in the state is furniture manufacturing. This industry uses the greatest variety of wood and utilizes large quantities of scrap lumber that would probably go to waste. The manager of one of the principal concerns says: "We use all kinds of fir, some cottonwood, ash, maple and alder. Only fir and ash show the slash grain and are sold as fir and ash furniture. Other woods have no figure in grain and are used for cores, drawer bottoms, backing and for enameling. We utilize all lengths. Only defects and edgings go into fuel bins. We saw from logs all so-called hard wood used, but buy the fir lumber. Very little, however, is so-called merchantable stock, for what we make takes short lengths. We can use cut-offs from the saw mills and in this respect make use of much material that would be and generally is sent to fire-hold or burner."

Fifty or more furniture factories are at present operating, but there is room for additional ones, as so much of our furni-

ture, especially office furniture, is shipped from without the state. As many as ten communities are asking for such establishments and it seems certain that this many and more ought to succeed if properly located and managed by experienced men.

The articles manufactured here at present include dressers, beds, commodes, tables, chairs, kitchen cabinets and many other items.

BOXES.

About fifty different concerns in the state are engaged in manufacturing boxes, including box shooks, bottle boxes, wooden packing boxes, crates for butter, fruits, berries and vegetables,

A big lumber mill at Spokane, daily capacity 300,000 feet.

egg cases and cases for canned goods, etc. Most of these factories are able to use short length lumber and work up their product so as to have little waste. The manager of one company states: "We are using the lumber up very closely. One small item is cleats, size 11½x¾, of which we manufacture about eight million each year. We also manufacture many small boxes, using for some parts of the box narrow strips either matched together or fastened with steel corrugated fasteners, in this manner using up a large number of scraps and cull lumber that we accumulate."

During the past season box factories have been hard pressed in their efforts to supply the demand, which is particularly keen, especially in the fruit districts, on account of the heavy yields of all kinds of fruits. Twenty-four communities have expressed a desire for such factories, which in many instances would serve

the double purpose of utilizing short pieces of wood and also of providing shippers with the necessary shipping equipment.

MISCELLANEOUS WOOD RE-MANUFACTURES.

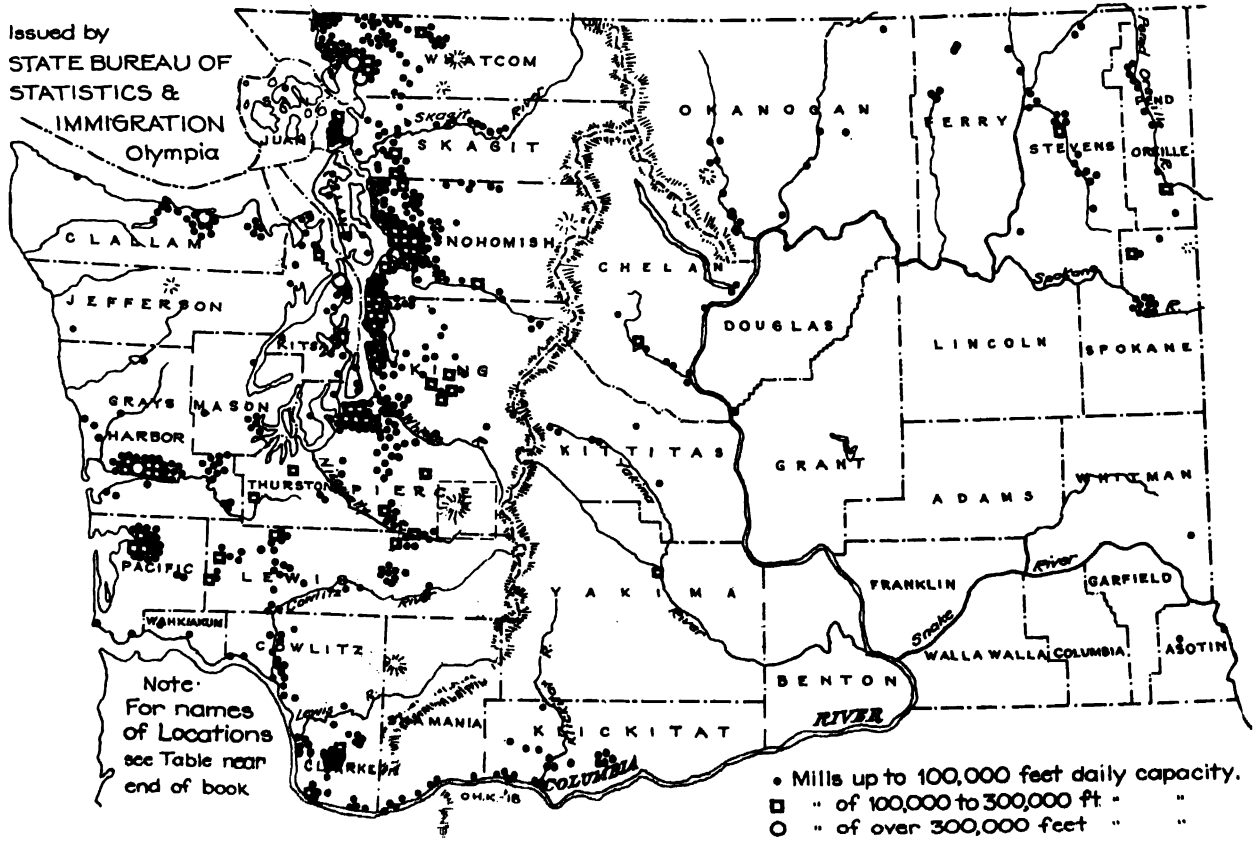
Among other lines of re-manufacture of lumber and timber products, at present followed to a greater or less extent in this state, are wood-stave pipe, silos (3 companies), matches (2 factories), cooperage (7 plants), incubators (3 factories), crossarms, gutter, broom and mop handles, violins and musical instruments, excelsior, and wood pulp. Among the items produced by the cooperage plants may be mentioned barrels, hogsheads, lard tubs, pickle pails, jell-pails, fish pails, fish kits, butter tubs, candy pails, vinegar and meat kegs. Stave silos and water tanks are manufactured in considerable quantities and there is a growing local demand for them. Wood-stave pipe is also becoming an important product. It is manufactured in both the creosoted and uncreosoted forms. Undoubtedly there are openings for additional manufacturing in these and other allied industries, especially if managed by men of business ability. Among other miscellaneous plants requested and not already mentioned are broom, cooperage, silo and general woodworking establishments.

One correspondent from eastern Washington suggests that there is an opening in the Spokane district for the manufacture of sleighs and logging sleds, which could be supplied more cheaply than they can be purchased in the east.

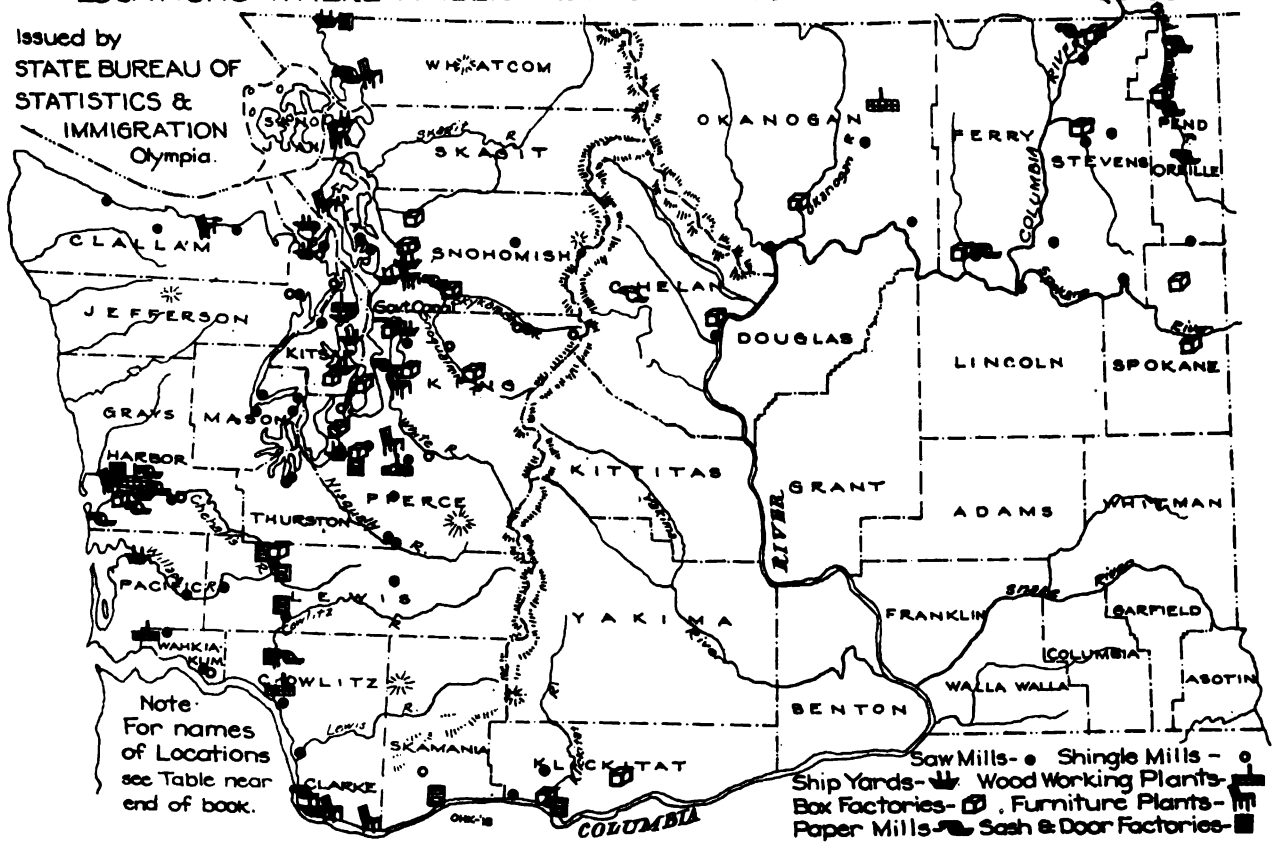
Four factories in this state are manufacturing ladders and stepladders and it seems that from the large demand existing for these articles, especially in the fruit districts, there might be opportunities for further development along this line. Another correspondent is of the opinion that some of the lesser known native woods might be used in various ways, suggesting that the manzanita is especially adapted to the making of "briar" pipes.

Excelsior manufacturing also has many possibilities, there being but one plant in the state at the present time. Cottonwood, of which there are unlimited quanitities, is used chiefly in the production of this commodity.

DISTRIBUTION OF EXISTING SAW AND SHINGLE MILLS



LOCATIONS WHERE TIMBER-PRODUCTS FACTORIES HAVE BEEN REQUESTED



WOOD WASTE UTILIZED.

In addition to re-manufacturing from merchantable timber, the problem of successfully utilizing the waste material from the mills and logging camps is very important. This opens up a large field for investigation and abundant opportunity for new industries. Prof. Benson, in the article following, calls attention to the fact that only about 32 per cent. of the lumber as it stands in the forest is at present utilized in any manner and suggests a number of uses to which this could be put by chemical processes. Other uses also have been mentioned already in connection with furniture and boxes.

This waste includes large quantities of short length lumber, narrow strips, slabs, edgings, knotty pieces and sawdust, much of which could be utilized in the manufacture of various useful articles requiring lengths of that sort and adapted to the utilization of cull lumber.

Although some of this waste is cut into slabs and sold for fire wood, yet by far the largest quantity is burned up immediately at the mill producing it. Most of the mills maintain huge "burners," into which all unmarketable material is carried automatically by an endless chain conveyor, thus keeping the great fire going day and night. These "burners" appear in the distance like great towers or lighthouses. One of the largest mills in the state, with a daily capacity of over 700,000 board feet, burns up between a thousand and twelve hundred cords every day in a huge "burner" 64 feet 8 inches in diameter and 106 feet high, which would represent in the neighborhood of a million feet of timber waste in one mill alone.

Of course arrangements would have to be made with the concern producing this waste before action could be taken for its utilization, but in most cases that would not be a difficult thing to do.

MISCELLANEOUS USES FOR WASTE.

There are many uses to which this waste could be put. Among other suggestions for the utilization of much of the short length and scrap lumber, and one which offers an attractive field of investigation for enterprising woodworkers possessing some imagination, is the making of novelty wood articles

and wooden toys. One man suggests: "A quantity of this surplus that is now being burned could be used for chair stock, pails, barrels, dowell-pins, carvings, all kinds of novelties, etc., but more than all combined it would make the very thing that is now so high and difficult to get as wanted, paper or paper pulp. This Northwest should take a lesson from Norway, Sweden and Canada. We are burning up what they turn into cash."

One idea which seems practical is that "an organization or company could be formed, which would maintain what might be called an assembling station, with the object of setting up several different articles of furniture, toys or anything that may be made of scraps that usually go to the fire room or woodpile, drawing this material from the various mills and factories which could supply parts of several different articles but could not furnish all the parts of any one article."

SAWDUST AND SCRAPS.

One of the biggest items of waste is the sawdust, one mill man stating that "an ordinary circular saw takes out nearly three-eighths of an inch, which means a loss of about one-third on every inch board cut." When additional loss in planing and trimming is considered, the net quantity of merchantable lumber from a log is less than one-half. Some way may be found to utilize most if not all of this lost material. The United States government experts in the Forestry Products Laboratory, after an exhaustive investigation of sawdust disposal, have completed a list of fifty different uses to which this material could be put, among the most important being manufacture of linoleum and artificial woods, certain kinds of wall papers, briquettes and in packing.

The utilization of any or all waste for the generation of power is of course always feasible, if there are factories located near enough to its origin. It has been suggested by several mill men that if there were a sufficient demand for electrical power near their mills, they could easily increase their boiler and dynamo capacity and produce this power very cheaply by burning in their furnaces much of the sawdust and scrap that is now wasted or burned on the slab-pile. By such means, woodworking

plants located near them might secure both material and power at a minimum cost.

One correspondent voices this idea in the following words:

"We ask that you give serious consideration to the matter of advising new industries of the possibilities of obtaining cheap power where they can be located in the close neighborhood of saw mills, particularly those that are driven by electric power. We think mills that are electrically driven have more fuel than they can possibly use under their boilers and are obliged to make heavy investments in refuse burners, etc., to dispose of surplus fuel. This waste will in most cases amount to more than the actual fuel consumed and if a market for the power could be obtained to warrant the investment in the additional boiler and power equipment, this power could be furnished very cheaply indeed to other factories. It appears to us that there should be a great development along this line and we will be glad to be put in communication with any factory concern to whom you think this would appeal."

PAPER AND WOOD PULP.

Just a word should be said regarding paper and wood pulp which has been touched on in a number of other places. Time and again it has been said, by men in a position to know, that the north Pacific Coast is to be the centre for the pulp and paper industry during the next few years. The woods suitable are hemlock, spruce, cottonwood and fir, each of which is found in unlimited quantities in Washington. One correspondent says:

"If it is true, as I understand it is, that hemlock pulp can be successfully utilized in the manufacture of paper, this would seem to be an opportune time to encourage the location of those experienced in paper manufacture in an enterprise of this kind. There is a vast amount of this wood in western Washington, much of which cannot be utilized in ordinary lumber operations, in consequence of which it is left in the woods to be destroyed by fire.

"I believe if your department can manage to reach individuals informed on the production of paper from wood pulp, with information as to the adequate supply of material, the ease with which it can be secured, and the relative cheapness of power, that a great deal can be added to the wealth of our commonwealth from this one industry alone."

At the present time there are four plants in the state with several additional ones being located, while fifteen communities are requesting plants in their vicinities.

A LARGE VARIETY OF OPPORTUNITIES.

In conclusion, then, it may be said that there are opportunities for practically every line of manufacturing which depends upon the wood of the forest for its raw material, no matter whether it be for the construction of those articles requiring the choicest lumber that can be bought or merely the inferior pieces or scraps that in many cases are at present being wasted, and ranging all the way from million dollar ships down to boxes that sell for a few pennies.

Although the increasing cost of labor and the accumulating cost of holding timber land make it unlikely that the price of lumber will ever again be as low as it has been in the past, yet, when all conditions are considered, there is probably no section anywhere to be found where the opportunities for lines of endeavor depending for their chief raw materials upon lumber or timber products are so generally favorable as in the timber regions of the State of Washington.

ASSEMBLING BOXES AT THE ORCHARD.

The demand for boxes is annually increasing and many communities report openings for box factories.

CHAPTER X.

THE BY-PRODUCTS OF THE LUMBER INDUSTRY.*

BY H. K. BENSON,
Director of the Bureau of Industrial Research in the University of Washington.

In a general way it is safe to say that an average of only 320 feet of lumber is used for each 1,000 feet that stood in the forest. This shrinkage is due to a variety of causes, such as loss of bark, sawdust, edgings and trimmings, slabs, carelessness in manufacture, loss due to standarizing lengths and widths, defective trees, broken logs, tops and limbs, etc. In considering the possibilities for industries dependent on wood for other uses than lumber, the supply may be obtained from (1) forest growth that is non-merchantable for lumber purposes, (2) logging waste and (3) saw mill waste. In this article only a brief survey of the industries which might be established by the use of species found in the state will be undertaken.

STEAM DISTILLATION AND EXTRACTION.

Where a constant supply of highly resinous wood such as Douglas fir or the western yellow pine can be obtained, the production of turpentine, pine oil and rosin can be undertaken. Such an industry exists in the South, where highly selected "light wood" (*i. e.*, very resinous) is used. The usual process is to chip the wood in a "hog," treat it with steam in a closed tank until the turpentine and pine oil vapors are driven off and condensed, forming a top layer of oil in the distillate. The chips in the still are next covered with a solvent such as gasoline or engine distillate which dissolves the rosin. This solution is next distilled for the recovery of the gasoline, and the residue, consisting of molten rosin, is run into barrels where it solidifies in cooling. The extracted chips are commonly used for fuel only, furnishing all the steam required in the process. Douglas fir is not sufficiently rich in oils to make it profitable to utilize common run saw mill waste or stumps, but its yields when especially selected are comparable to those obtained in the South. At the present time the industry would undoubtedly be profitable.

* For a fuller discussion the reader is referred to Special Agents' Series No. 110, Bureau of Foreign and Domestic Commerce, U. S. Department of Commerce, Washington, D. C. Price, 10 cents.

WOOD DISTILLATION.

Instead of treating the chips with steam, cord wood or slabs may be placed in closed retorts or ovens and heated externally for 24 hours, yielding light oil (crude turpentine), tar, charcoal, gas, and a watery distillate from which wood alcohol, acetone, and acetic acid may be obtained. This is a large industry, utilizing hardwoods and producing alcohol, acetone, acetate of lime, and charcoal as its main products, the gas and tar usually being burned as fuel in the process. From Douglas fir and pine, the yield of products in the watery distillate is not large enough to warrant this recovery and the merchantable products will therefore consist of light oil (from which turpentine and pine oil may be obtained by refining), tar, charcoal, and gas. One commercial plant at Auburn is now operating as a gas company. A good market exists for wood tar and oils in the flotation processes in mining, but the charcoal market is uncertain and seemingly dependent upon the development of electro-metallurgical processes, not yet in operation on a commercial scale. The industry is fairly well established in the South, utilizing the highly selected (resinous) long leaf pine.

TANNIN EXTRACT.

In normal times the United States produces only about one-half of the extract required for tanning. The bulk of domestic extract is made from chestnut wood, although hemlock and oak bark are extensively used in tanneries making their own extract and to some extent in extract plants. The content of tannin in chestnut wood is about 6 per cent. The bark of the Douglas fir contains about the same quantity. Selected slabs of fir, especially in mills using considerable hemlock, would serve as a profitable source for tannin. The western hemlock bark is now used as a source of tannin and contains about 14 per cent. of tannin. The western yellow pine and larch barks are also rich enough in tannin to warrant their utilization. The remoteness of the Pacific Coast from the large tanneries of the East is the only deterring factor in the establishment of the industry. The process is comparatively simple, consisting of chipping or shredding the bark, leaching with hot water, and concentrating the liquor to suitable concentration for shipment.

WOOD PULP.

Washington is rich in species suitable for the manufacture of wood pulp. Spruce, cottonwood, and fir are now largely used in the mills in this and adjoining states. Considerable slab wood is used in the East and recently several mills have been built in the South to operate on pine slabs alone. One of the difficulties of utilizing saw mill waste is in removing the bark from the irregularly shaped pieces, instead of the round forest wood gen-

A huge burner, 64 feet, 8 inches in diameter and 106 feet high, burning waste lumber at a Gray's Harbor saw mill. Will consume 1200 cords of wood each day.

erally used. Barking drums have been successfully used and when it is remembered that the bark is rich enough in tannin for the manufacture of extract, the cost item should not be considered prohibitive, provided that a tannin extract plant is accessory to the pulp mill.

The use of wood pulp for articles other than paper deserves recognition, especially in the manufacture of insulating conduits and fibre articles which are now only obtainable from the East.

PRODUCER GAS.

Mention has already been made of the manufacture of gas from wood by distillation. By the use of the gas producer, a

cheap fuel is obtainable for the operation of gas engines and for firing ovens in the ceramic, glass and chemical industries. One large concern in the South is entirely operated by gas engines using producer gas made from cypress mill waste. This plant produces its power at a total cost of only $0.225 per horse power hour and has found the installation highly satisfactory in every respect. The utilization of mill waste in this manner deserves wider recognition.

ETHYL ALCOHOL.

Sawdust may be treated with sulphuric acid in closed digesters under steam pressure, whereby a portion of it is converted into sugar. This may be fermented by the addition of yeast and ordinary grain alcohol obtained. This process has been successfully developed by the Dupont Powder Company at Georgetown, South Carolina, where the sawdust of three mills is completely utilized for alcohol manufacture. The process demands careful location as well as careful technical control to make it successful.

NEEDLE OILS.

The farmers of New England sell annually about $100,000 worth of needle oils made by distilling the leaves or small twigs of such trees as cedar, hemlock, spruce, fir and pine. They use simple home-made stills and sell the oil to wholesale drug houses and exporters. The oils are used for the manufacture of medicines, perfumes, deodorizers, etc. The needle oil of the native red cedar has been used to a small extent in the manufacture of insecticides.

WOOD FLOUR.

Finely ground wood, usually spruce, is used as an absorbent for nitroglycerine in the manufacture of dynamite. At the present time, the dynamite plants of the state ship in from the East their supply of this material.

In conclusion it will be seen from this brief summary that no single plan of utilization seems to become general. A careful, specific study should be made of each plant and the method selected which seems most practical in a given case.

CHAPTER XI.

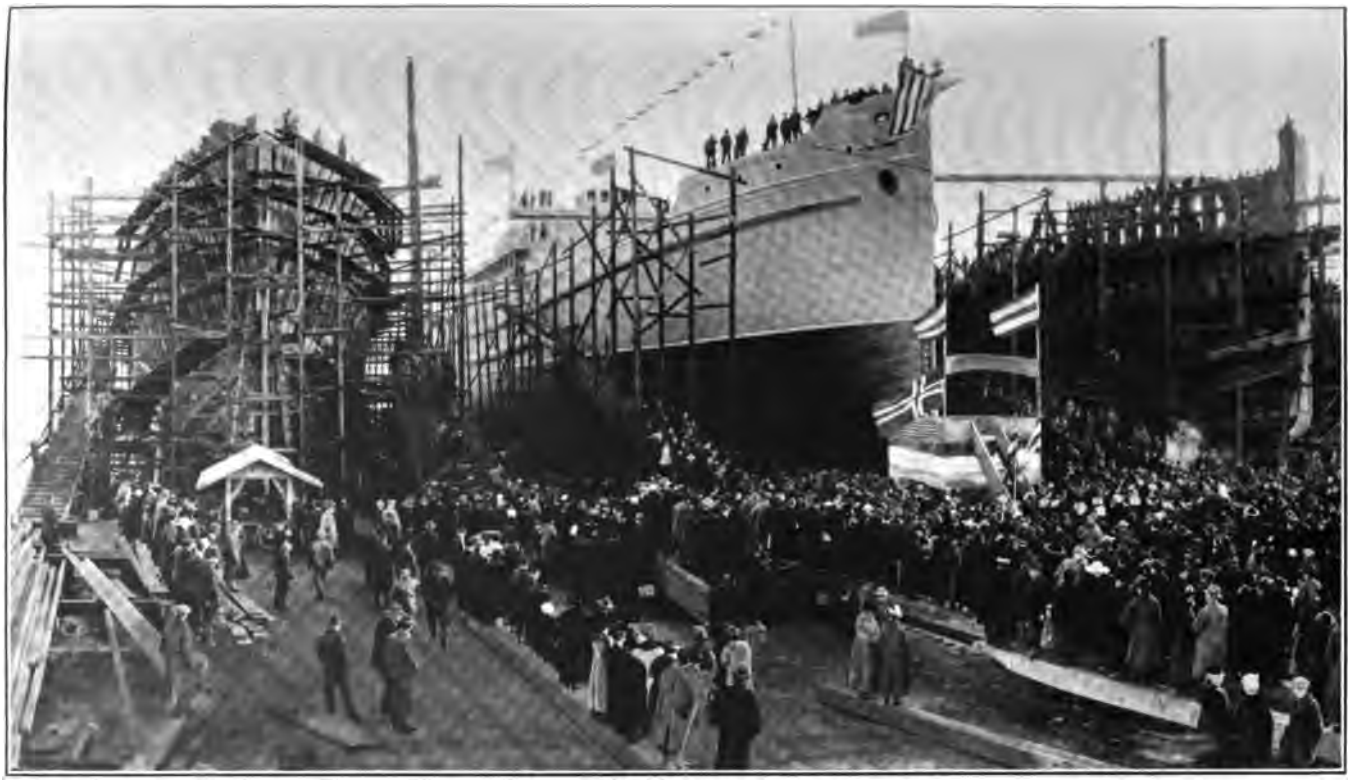
SHIP BUILDING.

No industry in the state has experienced so sudden and so rapid a development within the brief period of twelve months as ship building. While a few vessels both of wood and steel had been constructed in Washington yards prior to the European conflict, yet the industry as a whole was of minor importance, probably due partially to the general decline of the American merchant marine and to the high cost of steel on the western coast.

SUDDEN CHANGE.

The situation changed, as it were, over night. The wanton destruction of numerous vessels through submarine activities created an enormous and immediate demand for bottoms to carry supplies and munitions of war. The price of steel, to be sure, was still high everywhere and was steadily soaring; at that the supply was limited. On the other hand, the general demand for ships was becoming acute and had to be met. Then the question arose, why not wooden ships? Investigations were made. The enduring qualities of the hard, coarse-grained Douglas fir became known. It was learned, too, that on the hills of the State of Washington, overlooking great harbors and ideal sites for ship building construction, grew dense bodies of this and other timber well suited for this purpose, while huge mills with modern equipment were ready to saw this timber into any size or shape required.

The rest of the story is quite familiar. Men with a vision of the future and well supplied with capital came forward. The first of the new wooden ships were built in Seattle for a Norwegian company and several yards were soon started on the strength of the foreign business promised. Even before the United States declared war, wooden ship building had made a fair start and many contracts had been undertaken for foreign corporations.



Launching twin-screw steamer Abrigada at Grays Harbor. First wooden vessel launched for U. S. Shipping Board Emergency Corporation.

UNITED STATES BECOMES INTERESTED.

Early in the spring of 1917 the United States shipping board sent representatives to the Northwest to investigate the possibilities for the speedy construction of a large number of vessels. A meeting was held with the lumbermen and shipbuilders in Seattle, April 4, 1917. The findings of that board were summed up in the statement of Theodore Brunt, its vice chairman, who declared that the board was fully satisfied that Douglas fir was perfectly adapted for ship building purposes and that the Pacific Northwest would be looked to on account of its unlimited supply of such wood to render invaluable service in carrying out the ship building program. About that time, April, 1917, the tug, J. D. Boyden, built 29 years before, was docked on Puget Sound; numerous holes were bored in her hull; every plank was sound.

Since then the growth of the industry has been so rapid that any data compiled on the subject would be obsolete in a few weeks. In almost every important industrial center located on tidewater, ship yards have been planned and ways erected, upon which may be seen vessels in various stages of construction. Many have been already launched and some are now bearing valuable cargoes upon the high seas. Seattle, Tacoma, Olympia, Bellingham, Anacortes, Port Angeles, Port Townsend, Aberdeen, Hoquiam, Raymond and Vancouver all have active yards.

STEEL SHIPS.

While the building of wooden ships in this state has been more widely distributed and is of prime importance because the principal material used is produced locally, the growth of steel ship construction has been no less remarkable and the prospects for its future development are equally bright. In the four steel construction yards of Seattle, 23 cargo ships with a local dead weight capacity of 201,200 tons were launched in 1917. Three war vessels were also launched and a large amount of repair work done on government vessels and sequestered ships. Several contracts for naval vessels have been awarded to Washington

private yards and the Puget Sound Navy Yard at Bremerton is being equipped for major construction. A large plant for steel ship building has just been completed in Tacoma and the tonnage produced next year promises to be vastly increased. As elsewhere stated, announcements have been made of the contemplated erection of large steel plants on Puget Sound, the completion of which will obviate some of the delays experienced in securing material from the East and should greatly stimulate this industry.

RECENT DEVELOPMENTS.

Something of the rapidity of the growth of ship building in Washington may be comprehended from the statement that in September, 1916, there were 2,160 men employed in the ship yards of the state, but that by September of 1917 the number had increased to more than 16,000 men. There were at that time altogether more than 130 building ways upon which vessels totaling in value nearly $200,000,000 were being constructed. It is estimated that 26 per cent. of the shipping now being built in the United States is in the states of Washington and Oregon.

The principal types of wooden ships now under construction range in size from 2,500 to 4,000 tons dead weight capacity and from 250 to 390 feet in length. They cost from $200,000 to $500,000 each. One of these vessels requires from one to two million feet of lumber in its construction. The standard government vessel with a 280 foot keel, costing $500,000, requires 1,622,637 feet, board measure.

In addition to the building of larger ships, there has also been a considerable increase in the construction of small boats, lifeboats, etc., several companies having found this a very profitable line of endeavor.

FUTURE OF SHIP BUILDING.

As long as present international conditions continue, the demand for ships will undoubtedly tax the utmost capacity of all yards on the Coast. But it is by no means expected that the demand will cease with the resumption of pre-war diplomatic relations. Even after international peace has been brought about, the commercial energies of this nation must for years be devoted to supplying the needs of European nations during the

period of reconstruction, and to furnishing certain merchandise to other countries whose usual sources of supplies will have been either depleted or else cut off altogether, for the United States has been said to occupy "the best business stand in the world," and is considered also the greatest workshop and manufacturing plant.

New and undeveloped lands will also be ready for closer business relations with this country. From the Rio Grande to the Straits of Magellan there stretches a vast trade territory as yet scarcely touched by American commerce. This land is rapidly increasing in population and offers a fertile field for development. Our trans-Pacific commerce, too, is capable of enormous increase.

To carry on this interchange of raw materials and manufactured products, a great merchant marine will be needed. Ships and more ships will be the cry. The United States already has the greatest system of rail transportation in the world, one that is well prepared to carry the rich products of its inland districts to the great ocean ports. The total trackage nearly equals that of all the rest of the world combined. It is inconceivable that after the experience of the past few years, any opposition will remain to the maintenance of a merchant marine of sufficient magnitude to properly supplement and coordinate with such splendid railroad facilities.

A SIGNIFICANT QUOTATION.

Of particular significance in this connection are the words of a prominent Tacoma citizen:

"What of the future of wooden ship construction? Will it cease when the present emergency has passed? About 30 years ago wooden construction was superseded because with a world commerce, small compared with the present, the steel mills and steel shipyards were able to supply ships of larger tonnage at low prices. In consequence, a steady evolution in steel vessels as regards design, size and speed took place, but little progress was made in wooden ship building. The situation is different now. Steel mills and steel shipyards cannot supply the present needs of the world. We have returned to wooden ships. Is it not reasonable to believe that from this year forward, there will

be a rapid development in the size, uses and possibly the speed of wooden ships?

"The evolution of steel construction in the Northwest, too, will continue. It seems a certainty that before next year the building of one or more steel plants will be under way in the Pacific Northwest. If Portland, Seattle and Tacoma can develop great plants for building steel steamships based upon the hauling of steel from the Atlantic seaboard, what may not be accomplished when the steel is produced here at home?"

EXISTING OPPORTUNITIES.

The possibilities for profitable investment in this business are further indicated by favorable replies from individual communities to a questionnaire from this office. Fifteen localities report openings for shipyards and nearly all of them offer free sites or other assistance. (See table, page 215.) In several of these, no yards have as yet been established, while in the others additional plants are recommended because the citizens there feel that they would be remunerative enterprises.

These sites are commended to the prospective shipbuilder for investigation and it is hoped that they will receive at least a careful consideration by those in a position to engage in this industry. Today an added incentive is present; an enterprise so important as ship building has become a patriotic duty for those who can engage in it and not merely a good business venture.

Steamship Seattle, the first steel vessel delivered under direct contract with the U. S. Shipping Fleet Corporation. Built in 78 working days.

CHAPTER XII

MANUFACTURES FROM FRUITS AND VEGETABLES.

By far the greatest industrial demand in the State of Washington seems to be for establishments that will preserve or more completely utilize the large quantities of fruit, berries and vegetables which grow in abundance in nearly all parts of the state. Altogether seventy-seven different communities have requested the location of canneries, seventeen others have expressed a desire for fruit by-product plants, seven for potato starch factories, five for beet sugar factories and three for pickle plants. The widespread nature of the demand is shown by the fact that thirty different counties of the total of thirty-nine are represented and that communities as far apart as the boundaries of the state will permit are included in the list.

EXPLANATION OF DEMAND.

Such a tremendous demand cannot be accounted for without some knowledge of the agricultural growth which has been taking place in the State of Washington during the past few years, and the possibilities for further development along such lines.

In the first place, every part of the state, with few exceptions, will under proper care yield fruits and vegetables in more or less liberal quantities. Certain sections, however, seem better adapted to some crops than to others; or the people for certain economical reasons have specialized in one branch of the industry, thus bringing it to a higher stage of development than would otherwise be possible.

FRUIT DISTRICTS.

The fruit producing districts of the state may be classified as irrigated and non-irrigated; but by far the most important commercially are the irrigated sections. Practically all of the irrigated lands lie in the valleys east of the Cascade Mountains, not more than about 6,000 acres, including the Sequim and

Yelm projects, being under ditches in Western Washington. A considerable amount of non-irrigated fruit, also, is raised in some sections of Eastern Washington and almost all the Western Washington fruit comes under this head.

YAKIMA VALLEY.

The most extensive fruit section is the Yakima Valley which contains three-fourths of the irrigated land of the state. This valley includes parts of Kittitas, Yakima and Benton counties and possesses the largest area of orchard lands now in bearing in Washington. It was one of the earliest sections to develop commercial orchards and is distinguished for the diversity as well as the quantity of its products. During the season of 1914 there were exported from these three counties alone, 3,333,877 boxes of apples, 484,024 boxes of pears, 1,117,245 boxes of peaches, 18,956 boxes of apricots, 68,670 boxes of cherries, 4,135,260 pounds of watermelons, 153,695 crates of cantaloups, 96,712 baskets of grapes, 25,513 crates of tomatoes and 44,836 crates of strawberries. In addition to these shipments, large quantities of these fruits were consumed locally in the homes or utilized in the by-product plants. The production for 1915 was somewhat less but in 1916 and 1917 a large increase occurred. Preliminary estimates for 1917 place the total apple production alone of this section at more than 10,000 cars.

WENATCHEE COUNTRY.

The Wenatchee Valley located in Chelan County is famous principally for the high quality of its big red apples, which are shipped to all parts of the United States and to many foreign lands. Pears, peaches, apricots, cherries and plums are raised in smaller quantities. In 1914 Chelan County alone shipped 5,302.6 cars of apples, 250.5 cars of pears, 272.6 cars of peaches and 357.3 cars of prunes, plums, apricots and cherries.

Tributary to the Wenatchee Valley are a number of smaller or less developed sections which include the Entiat Valley, the Lake Chelan region, the Methow and Okanogan valleys, some narrow strips along the Columbia River and parts of the Big Bend country. In 1915 the four counties of Chelan, Douglas,

No. 1. Picking strawberries. No. 2. Picking peaches. No. 3 Blackberries. No. 4. Grapes. There is great demand for canneries to utilize these products which grow profusely in nearly all parts of the state.

Okanogan and Grant produced for commercial shipment 5,400 cars of apples, 350 cars of pears, 175 cars of peaches and 155 cars of apricots. In 1916 over 7,000 cars of apples alone were produced and about 700 cars of other fruit. In 1917 about 7,500 cars of apples and 600 cars of miscellaneous fruits were produced in this section.

SPOKANE AND SOUTHEAST WASHINGTON.

Spokane County ranks third among the fruit counties of the state. Tributary to it are the Colville and Pend Oreille valleys, the Palouse country, in certain parts of which a limited quantity of fruit is raised, and Northern Idaho.

Portions of the state south of the Snake River, particularly around Walla Walla and Clarkston, are also substantial producers of fruit.

WESTERN WASHINGTON.

In Western Washington, the principal commercial orchard crop is prunes, which are grown extensively in Clarke and Skamania counties; but the growing of pears is rapidly making headway, for experts agree that the soil and climate throughout this section are ideal for that crop. Berry growing has attained the greatest commercial success in the Puyallup Valley where special marketing facilities. have been developed. Large shipments of the fresh berries are moved in refrigerator cars to eastern centers, while local canneries and processing plants conserve the residue. The Snohomish Valley and sections of King and Lewis counties also produce considerable quantities of small fruits and berries. Vashon Island and Kitsap County, besides producing much other fruit, are the principal strawberry sections of Western Washington, although this berry grows in almost any part of the state. Apples are produced in abundance, but commercial orchards are not extensive; about 800 cars were probably produced in 1917. Cherries are an ideal crop for Western Washington but large quantities are often left to spoil on the trees because of insufficient marketing facilities.

TOTAL FRUIT CROP.

While the fruit crop is naturally subject to fluctuation, the entire state markets yearly more than 15,000 carloads, valued

at from ten to twelve million dollars. Estimates for the year 1917 place the total production of apples alone in the state at nearly 20,000 cars, a larger quantity than that of any other state and more than the combined commercial production of New York and Missouri, formerly the leading apple states in the Union. Other fruits produced, not counting that used in by-product factories, were: Peaches, 2,112 cars; pears, 1,465 cars; and cherries, plums, apricots, strawberries and other small fruit, 1,000 cars.

The total commercial production of fresh fruits marketed during the season of 1915, the last year for which final figures are available, was as follows: Apples, 9,551 cars; pears, 1,416 cars; peaches, 2,092 cars; grapes, 56 cars; plums and prunes, 523 cars; apricots, 176 cars; cherries, 321 cars; watermelons, 164 cars; cantaloups, 336 cars; tomatoes, 90 cars; strawberries, 345 cars; other berries, 586 cars; mixed fruit, 758 cars. During the same time by-product plants used: Apples, 14,202,580 lbs.; pears, 2,161,862 lbs.; peaches, 585,702 lbs.; plums and prunes, 1,363,538 lbs.; apricots, 163,305 lbs.; cherries, 1,297,420 lbs.; grapes, 678,950 lbs.; raspberries, 4,946,144 lbs.; blackberries, 3,417,152 lbs.; strawberries, 1,466,674 lbs.; other berries, 979,517 lbs.

The tendency is for a very large increase in most of these fruits in the future as the younger orchards begin coming into bearing. Four years ago the total number of bearing trees of different kinds were estimated to be as follows: Apples, 5,608,593; pears, 397,320; peaches, 593,239; apricots, 69,166; plums and prunes, 821,078; cherries, 241,284. The fruit trees then five years old or younger totaled: Apples, 3,952,585; pears, 170,414; peaches, 52,718; apricots, 26,935; plums and prunes, 174,298; cherries, 59,059. During the seasons of 1914 and 1915 there were planted: Apples, 263,332; pears, 69,842; peaches, 18,787; plums and prunes, 76,305; apricots, 9,395; cherries, 68,846. While some trees have died and orchards been cut down since that time, the new plantings have more than offset the loss, so that the total number of trees in the state has undoubtedly increased rather than diminished.

VEGETABLE PRODUCTION.

Not so much data is available regarding the quantity of different vegetables produced in the state, as of fruits. The main crop for commercial purposes is potatoes, to which about 60,000 acres are devoted annually. The average yield per acre is from four to five tons, but the best lands go much higher, often as high as fifteen tons. Washington's annual contribution is nearly ten million bushels, or about 300,000 tons. Other vegetables besides potatoes grow well in all parts of Western Washington and in most sections of Eastern Washington, excepting in the very dry sections where water is not available. The market gardeners work the heavy soils closest to the larger cities.

Indicative of the soil fertility for vegetables, it has been estimated by authority that an average yield per acre, under good conditions, of valley land similar to that in the Puyallup Valley should be: of potatoes, 5 to 7 tons, depending upon variety; of onions, 8 to 12 tons; early cabbage, 10 to 12 tons; late cabbage, 20 to 30 tons; cauliflower, 9 to 15 tons; celery, 8 to 10 tons; string beans, 4 to 5 tons; green peas, 2 to 4 tons; table beets, 3 to 12 tons; rhubarb, about 10 tons; and squash, 20 to 25 tons. The best of the irrigated lands will yield equally well or better, as shown by the fact that the average yield of potatoes per acre on the Sunnyside project in 1915 was 217 bushels and the maximum 600 bushels. "Fruits and vegetables in abundance wherever you have a notion of planting them; there are thousands of dollars' worth of canned stuff shipped in every year; why not ship it out?" says one correspondent. This may be considered a representative statement regarding conditions in most other parts of the state.

Commercial shipments are made annually of potatoes, onions, egg plant, cabbage, cucumbers, rhubarb, carrots, asparagus, celery and smaller quantities of other miscellaneous vegetables, chiefly from the Yakima Valley, Spokane County and Southeast Washington. The extent to which production could be carried on is limited only by the market for the products, or the demand on the part of the canneries and by-product

plants. The variety is limited only by the possibilities of a temperate zone.

SURPLUS FROM SPECIALIZATION.

From the foregoing it can be readily understood that the State of Washington is well adapted to the raising of fruits and vegetables, and that some sections have already experienced considerable development along such lines, while others are rapidly advancing. It stands to reason that where specialization either in fruits or vegetables is emphasized, particularly where perishable crops are concerned, a heavy surplus must

A PRUNE ORCHARD.
Washington stands third in the union in total production of plums and prunes.

occasionally occur, which cannot be readily assimilated with the world's commerce. To lessen the chance for such a condition, various selling agencies or associations have been formed, aided by the United States Department of Commerce, which is represented in this state; also by the State Bureau of Markets created by the last state legislature.

In spite of such precautions, however, the chances for a certain amount of waste still exist. Where a stiff market prevails, as it has during the year 1917 (a most exceptional year), products considerably below the highest standard will readily

find purchasers; but if, on the other hand, a heavy yield in a particular crop has been realized in most sections of the world which produce it, products which are not strictly first class will suffer and the resulting profit to the producer may be so small that it may not pay to pack them at all. Under such circumstances canneries or by-product plants would save these lower grade materials and net the producer something for his surplus.

EVIDENCES OF WASTE.

But a large percentage of the waste which occurs, especially in the orchards, is not necessarily on account of too large a crop. There is bound to be more or less waste under any circumstances, since products which are undersized, injured in harvesting, slightly diseased, or blemished in any manner, cannot usually be put upon the market. For the year 1916 the Wenatchee district alone reports that more than a thousand carloads of apples were left in the orchards because of lack of market. In the same valley it is estimated that, in 1915, 800 carloads of wormy cull apples went to waste and that 116 cars of loose apples were shipped to by-product plants in other parts of the state.

Definite figures of unutilized material cannot be obtained, as there is no report made by the different orchardists and gardeners regarding such materials. It is evident, however, that thousands of tons of fruits, berries and vegetables are allowed to rot every year or be only partially utilized. Such waste is not confined to any one section but to all sections.

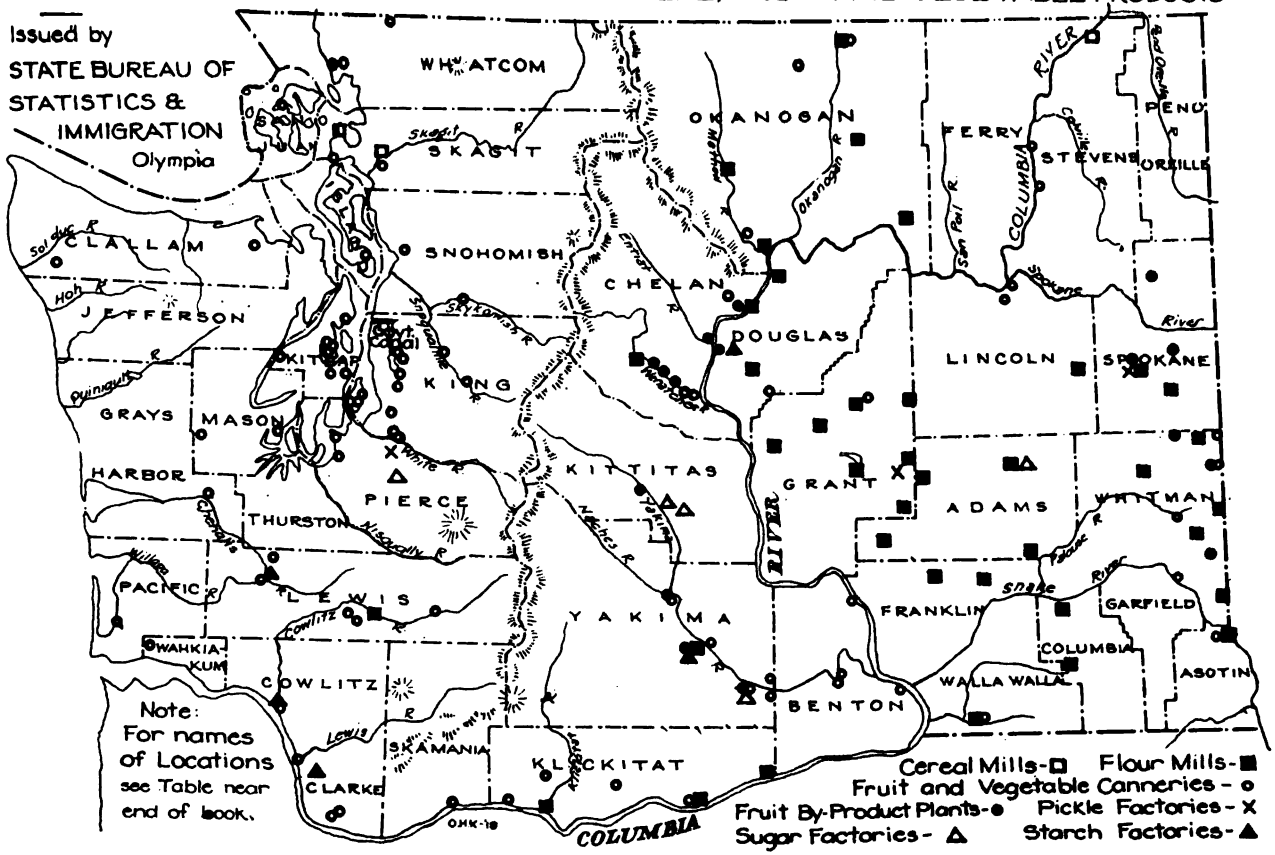
In a bulletin issued by the State College the following significant statement occurs:

"One of the most serious and pressing problems at present confronting the fruit growers of the state is the problem of making such disposition of their low-grade and surplus fruit as shall convert it into an assured source of revenue. The aggregate losses sustained through failure to make profitable disposition of low-grade and cull apples, surplus berries, cherries, peaches and other fruits which cannot be shipped to distant markets in the fresh conditions are already high, and will increase materially as the more recent plantings come into full bearing."

"Much waste" is the main reason given by many of those asking for canning or by-products establishments in their communities. A correspondent from Kennewick says: "There are hundreds of acres of orchards in bearing and many acres of other products, some of which go to waste now, that could be harvested at the right time and made use of in such a plant; and the present acreage of many products can be trebled and more if a dependable market can be assured." Another from Peach, Lincoln County: "Considerable fruit grown along Columbia and Spokane rivers tributary to this point but so far from transportation that all but the best goes to waste." Sundale, Klickitat County: "There are about 400 acres of orchards here and this being about five miles from station it has been found that the fruits, mostly apricots, do not ship well after being handled that distance fresh." Toppenish, Yakima County: "Great quantities of fruit in territory tributary to Toppenish not utilized, particularly low-grade variety." Zillah, Yakima County: "Tons of peaches and pears go to waste every year." Colfax, Whitman County: "Yes, in this immediate vicinity a great quantity of apples, cherries, pears and berries go to waste every season. Green beans, peas, corn and other vegetables would be raised in large quantities if a market were provided." Byron, Yakima County: "This is an irrigated district. A great deal of fruit is grown and much goes to waste that is not suitable for shipping market in present form." Gifford, Stevens County: "Large quantities of fruit grown here which could be better handled in condensed form than otherwise. Much of the fruit is allowed to decay owing to the expense of shipping in its bulky form."

The percentage of fruit wasted is especially large in many sections of Western Washington, where tons of apples, pears, cherries and berries are grown, but where marketing facilities have not been sufficiently developed. The flavor of most fruit grown west of the mountains is exceptionally good; but the fact that some varieties are not so highly colored nor handled so carefully as in the famous orchards of Eastern Washington prevents its attaining the highest commercial value as fresh

LOCATIONS DEMANDING FACTORIES FOR CEREAL, FRUIT AND VEGETABLE PRODUCTS



fruit. For the preserving plants, though, such blemishes would not be considered objections.

A correspondent desiring a cannery at Deep River, Wahkiakum County, says: "There is a lot of fruit such as apples, pears and evergreen blackberries that goes to waste in this and neighboring communities each year on account of the poor market for same. This fruit could be bought cheap from the farmers and there is no question but that the enterprise would be profitable. There is considerable fruit raised in this locality and all of the fruit on the Oregon side of the river as far up as Rainier, Oregon, could be profitably bought and canned here. There are carloads of evergreen blackberries in the Nasal River district, 5 miles from Deep River, that rot every year because the expense of shipping them to the cannery at Chehalis eats up all of the profits of picking them."

A prominent citizen at South Bend, Pacific County, says: "Several carloads of evergreen blackberries and other fruits are going to waste each year; also quantities of vegetables. A large amount would be grown if there was a market." Mossy Rock, Lewis County: "It is a very good fruit growing country and lots of fruit is spoiled every year." Steilacoom, Pierce County: "A great deal of fruit and vegetables raised on the various islands and mainland which now go to waste could be used, and the amount now raised vastly increased, if there was any incentive." West Sound, San Juan County: "There is a lot of fruit goes to waste every year that could be bought cheap and canned." Lisabuela, King County: "Much fruit and berries are lost annually because of low prices." Medina, King County: "There are so many fruits and vegetables going to waste." South Colby, Kitsap County: "Every year hundreds of tons of fruit go to waste because we have no market; if we had a cannery the farmers would be encouraged to save their fruit as well as plant more vegetables." Centralia, Lewis County: "Large quantities of low-grade apples are going to waste in this community every year; also cucumbers and other pickles. Fruits do well here and cabbage does better in this vicinity than in any other region of the west. The apples and fruit are at hand and the rest of the materials can be produced

in a year." Montesano, Grays Harbor County: "Tons and tons of evergreen blackberries go to waste here."

PRESENT EFFORTS TO CONSERVE INSUFFICIENT.

Such are a few instances, chosen at random, of communities asking for fruit or vegetable preserving plants because of the almost universal waste tolerated in the year 1916 and previously. To be sure, the increased cost of many food necessities has resulted in greater efforts at conservation during the year 1917 and brought about the establishment of some additional plants and the organization of many home and school canning and preserving clubs; but such sporadic efforts will be far from sufficient to make use of all the surplus to be expected in the future or encourage further agricultural development.

CANNED FOOD A NECESSITY.

It should not be forgotten, also, that the world is gradually getting into the habit of using more and more canned goods, especially since modern science has more nearly solved the problem of perfect preservation. Canneries are not simply plants for saving waste products as formerly. They have become necessary establishments from every standpoint. If there were no surplus it would be necessary today to plant extensive areas in order that a supply might be available after the season had gone by, or for those sections of the world where similar products do not grow. In fact, every year in some sections many farms or gardens are planted with no other purpose than selling to the cannery and keeping it properly supplied with the crops necessary for its maintenance.

This takes the cannery out of the class of a "scavenger" as formerly considered and makes it one of the dignified establishments of the country. From this standpoint, it becomes one of the greatest agencies in building up a fertile country and, in turn, benefits from the good which it has accomplished.

There are many sections in Washington where production could be greatly enhanced if the growers could be sure of disposing of the crop at a price sufficient to justify the expense and effort. They would willingly make contracts with any reliable cannery to raise the material needed. There are districts

satisfactory for the enterprise where no development whatsoever has taken place, sections which might rival the Puyallup Valley in the yielding of by-products from fruits and vegetables. Such districts are both in Western Washington and in Eastern Washington, where new irrigation projects are being planned or old ones extended.

MORE PLANTS NEEDED.

From the foregoing facts recounted, it must be quite apparent to anyone interested that additional fruit and vegetable plants are needed:

First, to preserve the materials going to waste;

Second, to give more stability to the market for certain products;

Third, to encourage old sections to greater effort and open up new districts;

Fourth, to supply the producing localities as well as other parts of the world with canned fruit and vegetables, and to insure for them certain luxuries which depend upon such crops for their manufacture.

KIND OF PLANT.

Just what sort of plant is best suited to a community's needs should, perhaps, be left to the decision of those in a position to undertake the work. The economic changes which are rapidly taking place make it necessary to give special consideration in every instance. The 1914 census of manufactures showed the presence of 18 plants in the state engaged in the canning and preserving of fruits and vegetables, and 12 manufacturing pickle preserves and sauces. This, of course, did not include the individual dryers or evaporators, which are necessary parts of the equipment of the prune growers of Clarke County, where most of the plums and prunes of the state are produced; 256 dryers are reported for that county alone.

COMBINED CANNERIES IN DEMAND.

The main cry is for combined canneries, as they stand a better chance of being supplied with material most of the year, without the need of increasing either the equipment or the number of the operators. As an example, one cannery reports that

Fifty-five carloads of apples were gathered from a forty-acre orchard.

in 1916 it canned: Apples, 1,045 tons; pears, 186 tons, peaches, 1 ton; cherries, 111 tons; strawberries, 221 tons; blackberries, 1,024 tons; raspberries, 1,485 tons; other berries, 375 tons; beans, 6 tons; cabbage, 675 tons; squash, 67 tons; cucumber pickles, 600 tons; grape juice, 15 tons. Additional items reported by other factories, illustrating the variety of products, are apricots, quinces, plums and prunes, crabapples, gooseberries, cranberries, currants, tomatoes, cauliflower and spinach.

Some of the larger plants combine with their cannery department an evaporating plant where portions of the fruit not so well adapted for canning can be dried. The more complete factories also utilize the peelings and pulp of some of the fruits in making vinegar, which is either sold or used in their own pickling departments.

Since the state is now in the prohibition column, various juices have become very popular, including loganberry juice, apple juice, cider and grape juice. Jellies, jams, apple butter, syrups, vinegar, etc., are almost household necessities.

Beet sugar plants, which are just beginning to be established, and starch from potatoes, which has thus far received no industrial attention, have been noted in the chapter entitled "Miscellaneous Manufacturing Possibilities."

EVAPORATORS AND CANNERIES COMPARED.

Bearing on the decision as to the class of plant to be chosen, the following salient points taken from a late State College bulletin are of marked importance:

"Since there are, broadly speaking, two general methods of preserving perishable foodstuffs, by sterilizing with heat and sealing, or by reducing the moisture content to a point at which growth of bacteria and fungi cannot occur, the by-products plant must be either a cannery or an evaporator. If it is to utilize fully all the unmarketable and surplus fruits of its district, the cannery must carry on such related activities as the making of jams, jellies, marmalades, preserves, fruit butters, and cider or vinegar; while the evaporating plant may advantageously utilize its waste by manufacturing vinegar therefrom. Consequently, any step toward utilization of low-grade fruit in a community involves first of all a decision as to whether a

cannery or an evaporator will best meet the needs of the particular case. A very large number of factors, some of which are obvious while others are apt to be overlooked by persons unfamiliar with the operation of such plants, need to be very carefully considered in making such a decision.

"Briefly stated, success in the establishment and operation of a cannery demands ample capital for installing efficient modern equipment and employing well trained and experienced supervisors of the technical processes involved, as well as for the purchase of cans, raw materials and labor, and for carrying the manufactured product in storage until favorable marketing conditions are obtained. There must be available at moderate prices an ample supply not only of fruits but of vegetables also, in order that overhead charges may be reduced by a long working season at full capacity. Transportation facilities must be good and rates must be favorable, since the plant will purchase its cans and its fuel at a distance and will have to transport its bulky product to the markets. Fuel and labor must be obtained at moderate rates. Finally, every cannery has to solve a marketing problem distinct from that of every other similar concern.

"Comparatively speaking, the evaporating plant has many advantages over the cannery. The initial cost of building and equipment necessary to handle a given volume of material is much less; the machinery is less costly and depreciates much less rapidly. The employment of a technically trained, high-salaried supervisor is not necessary. Therefore, the fixed charges (interest on investment, depreciation, insurance, supervision) are proportionately lower and many of the best evaporators of the eastern apple districts make a profit despite the fact that they dry nothing but apples, hence operate only about sixty days each year. Under the conditions prevailing in Washington this would scarcely be possible, but there are few districts in the state in which an evaporator would not have either peaches, berries or prunes in some quantity, to lengthen its operating season. While the evaporator is by no means independent of facilities for transportation, it has the enormous advantage that it produces a concentrated product which can be transported far more cheaply than either fresh fruit or canned goods; which requires no outlay for expensive containers, and which can be stored almost indefinitely, under proper conditions, in relatively small space. Finally, the product is one which is readily examined and graded, hence every lot goes on the market at the price to which its quality entitles

it, and does not depend upon brand name or previously established reputation for its sale."

CONDITIONS FAVORABLE.

Whatever the requirements of any particular cannery or evaporator might be, however, it is quite certain that the State of Washington offers as favorable conditions as can be expected anywhere for its installation and successful management. The raw materials for every kind of establishment needing fruits or vegetables of any variety are either already here or the chances are good for their production. A careful investigation of the conditions and opportunities in Washington is recommended on the part of those given to the work of preserving food materials from useless decay or perfecting their utilization.

APPLES CULLED AT PACKING HOUSE.

Thousands of tons of fruit are annually lost for lack of factories to conserve the waste.

CHAPTER XIII.

MANUFACTURES FROM CEREALS.

BY GEO. A. OLSON,

Chemist, Washington Experiment Station,
and State Chemist.

Wheat is the principal cereal grown in the State of Washington. Its average yield is approximately 40,000,000 bushels, a quantity which places this state seventh in the Union from the standpoint of wheat production. Oats, next in importance, amount in quantity to about one-third of the wheat produced in the state. Barley production comes next, reaching about 6,000,000 bushels per annum. Practically all the commercial wheat and barley and a large share of the oats of the state is produced in Eastern Washington. Soft wheat, suitable for feed is grown in Western Washington and some of the valleys of this section have phenomenal yields of oats. The quantity of rye, corn, buckwheat, flax, etc., is comparatively small.

WHEAT.

In the earlier period of agricultural development most of the wheat raised in the state was exported to foreign countries. At the present writing approximately one-half of the total production is reduced into flour in mills located in various parts of this state; the remainder is shipped out of the state either to various points in the United States or to some foreign country. Thus it will be seen that we are passing from a condition where little wheat was milled into flour to one where the manufacture of flour is a large and important industry. A similar future development means that more food products will be manufactured within the state.

Generally speaking, the wheats produced in the state are known as soft wheats, but some of the well known harder varieties are also produced here. The larger part of the hard wheat entering our mills, however, comes from states east of us. The flour made from the soft wheat is exceedingly white, while that made from the harder varieties is comparatively dark. Flour made from a mixture of the soft and hard type wheats improves the strength of the former and gives a better color to the latter.

These blended flours are considered as general all round ones, particularly suited to the various needs of the household. Besides the blended flours there are soft wheat flours made from one or more of the various varieties of soft wheat, and hard wheat flours made from hard wheat. The object of mixing or blending is to make a more uniform quality of flour than would be possible otherwise.

The hard wheat flours are the bread flours much sought for by the bakers. Owing to the limited amount of hard wheat produced in the state, it follows that either the mills or the bakeries must purchase their wheat or flour from points outside of the state. It is needless to say that a good grade of hard wheat can be produced in the state and there is a possibility that a great deal will be produced, providing the incentive to raise such wheats is present. Comparatively, the yields obtained by producing the soft varieties are much higher than those obtained from the hard varieties. The higher price for the lower yielding hard wheat is not sufficient to make up for the higher yield of soft wheat sold at a lower figure. This is unquestionably the main reason why the farmers are inclined to grow the soft wheat.

The quality of the flour made from soft wheat is good and with new methods of treating the wheat together with the added machine improvements the flour made is steadily improving. This transformation of quality has resulted from what appears to be forced competition, inasmuch as very little wheat is now being exported to South America and Asia.

While it has been recognized that the hard wheats are particularly suited to the bakers' needs, it should not be overlooked that the soft wheats can be equally as well utilized by them in a somewhat different method of handling the dough during the process of fermentation. What is needed in conjunction with the milling industry is the active co-operation of persons capable of showing the trade and the commonwealth in general the value of our home-made products, especially persons who know how to make bread from the flour milled from our home-grown wheats. Such a campaign has been made in some of our

WHEAT FROM FIELD TO FACTORY.

No. 1. Sacked for shipment. No. 2. Making macaroni. No. 3. Type of local mill. No. 4. The heavy yield for which Eastern Washington is famous.

eastern states and a similar one should be conducted in this state.

The unmixed soft wheat flours are used for other purposes besides making bread. Large quantities are shipped to various places in the east to be used as pancake, pastry, biscuit, or cracker flour.

The pancake flour is mixed with the necessary chemicals to make self-rising flours and these are sold in the southeastern part of the United States. The self-rising flour should be prepared at home and thereby avoid the extra cost involved in rehandling the flour.

The soft wheat flour, low in gluten, has been found to be exceptionally suited for pastry purposes. Such flour requires less shortening than that made from wheat carrying a large quantity of gluten.

Pie manufacturers of the east who have tried our pastry flour find it economical to use and that it pays to buy it because the saving in shortening more than offsets the high freight rates charged.

Flours carrying a semi-strong gluten content are particularly suited for the making of soda crackers. The manufacture of soda crackers is an industry in itself, and gives promise of developing to larger proportions owing to the fact that we produce the flour from which the best quality crackers can be made. As a state industry this should be enlarged upon and the sale of the product extended to the eastern markets.

Flours rich in gluten, such as those milled from durum wheats, to which some portions of Washington are well adapted. are best suited for the manufacture of macaroni and other forms of "Italian paste." This industry has already been established in several locations in the state and is capable of much greater development.

The remainder of the wheat produced in this state is disposed of in various ways. Some of it is milled into flour, some is made into breakfast foods and some is used as stock food. From the soft wheats used separately or in combination with other cereals excellent breakfast foods can be made. Manufacturers who make products like wheat flakes, shredded wheat bis-

cuit, cream of wheat, etc., will find our wheats suited to their needs. This phase of industrial development is worthy of consideration, inasmuch as the farmers of this state will produce wheat for many years to come. The manufacturing of the modified or finished product in the west has another advantage, namely, only one transportation charge instead of two as prevails at present.

STARCH, GLUCOSE AND GLUTEN.

Another possibility, so far as industrial development is concerned, has reference to the utilizing of wheat which, considered undesirable for milling, or for breakfast foods, might be manufactured into starch, glucose and gluten. The quality of starch and glucose made from wheat is as good as that made from corn, or other starch-carrying cereal. In fact the writer is of the opinion that a better grade of starch and glucose can be made from the wheat grain than it is possible to make from corn. While the use of wheat for making starch and glucose is not new, the separation of the gluten and its preparation into a useful food product according to the writer's method* is new. Instead of making glue, or feed for stock, the writer proposes that the gluten should be handled in the manner which he has perfected, namely, by retaining all of the original properties which gluten possesses; thereby preparing a material that can be used as an additional component for re-enforcing weak flours when strength is desired, or in combination with other materials as high protein foods, or as a food for flatulent or diabetic individuals.

In connection with this industry other products are made, such as stock food, etc. The manufacturing of starch, therefore, can be made a big industry and from a commercial viewpoint it is a very desirable one to follow. It should certainly be financed and developed.

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*The process of preparing the gluten so that it retains its original properties is an invention of the writer. A patent has been requested and given to the people of the United States of America. This procedure will give anyone who sees fit to use the process, the right to make gluten according to the writer's method without paying any royalties. The process will be described in one of the Experiment Station bulletins issued at Pullman, Washington.

OATS.

While the amount of oats produced in this state is comparatively small (13,000,000 bushels), their quality is good. The berries are plump and contain considerable meat. The better grades are selected for making breakfast foods and the less meaty types are generally utilized in various ways as stock food. Owing to the excellent quality, more oats should be produced. They are well adapted to a system of rotation and the farmers should endeavor to grow this cereal in rotation with

A flour mill at Walla Walla. This county produces 5,000,000 bushels of wheat annually.

other crops. The breakfast varieties should be grown only on land that is free from wild oats, since the hulls of the latter are difficult to remove and when present the value of the breakfast food is lowered. A campaign to utilize the home grown oats and home-made cereal as a breakfast food will do much toward encouraging the farmers to grow not only more oats but better oats.

BARLEY.

The cereal which ranks next in point of production is barley (6,000,000 bushels). The larger part of the barley grown in this state has been used in stock feeding. Some of the varieties

have been used in making barley malt. The brewing industry, however, cannot now be considered important and as a result more barley will be available for other purposes. On the other hand, a limited amount of barley malt has been used in making malt extract and also in making non-alcoholic drinks. The malt extract is a valuable food for yeast and, as such, bakers make use of it in connection with dough fermentations.

In addition to the above named products made from barley, may be mentioned the manufacture of pearl barley and barley flour. Both of these last mentioned substances are important sources of food, and through organized effort it is possible to encourage their more general use. First class pearl barley is uniform in color and size. Certain varieties are more suitable for the making of pearl barley than others, and those who contemplate raising barley that will meet the above requirements should endeavor to keep the strains pure at all times; otherwise grains of varying color will surely follow. As much as 50 per cent. of barley flour has been mixed with wheat flour in bread making with good results.

CORN, RYE, BUCKWHEAT AND FLAX.

The cereals, corn, rye, buckwheat and flax are not extensively grown in this state. Corn is grown chiefly in the irrigated districts where the climatic conditions are suitable for its complete development. It is also grown in scattered places over the eastern part of the state and especially in selected places where the dangers of frost are slight. The annual yield is about 1,500,000 bushels. In the East, corn has been made use of industrially in various ways, among which may be mentioned the manufacture of starch, glucose or corn syrup, corn oil, hominy, grits, flour, meal and flakes. Most of the corn grown in this state is used as stock food.

About 100,000 bushels of rye is raised annually in Washington, but the flour made from it is comparatively weak and light in color. The eastern rye flour is stronger and darker in color and seems to appeal to the public more than the lighter product.

Very little buckwheat is grown in this state. The census figures give a yield of approximately 3,000 bushels.

Flax has never been grown in large quantities. If the growing of this commodity should ever become extensive it would find an ever increasing demand. Our present linseed oil supply is inadequate to meet the demand and much of that now offered for sale is mixed either with some other vegetable oil, such as soy bean oil, or with fish oil with or without crude oil products. The linseed cake derived by expressing the oil from the seed is also valuable as a food for stock and, owing to its laxative qualities, is almost indispensable in connection with other stock foods.

BEST OPPORTUNITIES FOR WHEAT PRODUCTS.

Summarizing this article on "Manufacturing as Related to Cereal Production," it is the writer's opinion that the best industrial development will be found in connection with the various ways of handling our surplus wheat. The flour products of known merit should be produced in larger quantities and new buyers sought. The varieties of breakfast foods that can be made from wheat alone or in combination with other cereals are numerous enough to justify manufacturers of this line of goods in establishing plants at the various centers where the varieties suitable for their needs are to be found. The manufacturing of starch, glucose, gluten and other products from wheat, appeals to the writer as one of the most promising industries that can be developed. For the present, these products are obtained exclusively from central western states and are derived from a cereal that has objectionable qualities. The gluten prepared by the patented method should be considered the product, and the starch and glucose the by-product.

To a less extent oats and barley have an important relation to the industries. A propaganda on their use in the diet will do much towards encouraging the farmers to produce more and better oats and barley, and at the same time be of material assistance in creating a demand for the manufactured products.

CHAPTER XIV.

DAIRY AND OTHER LIVESTOCK PRODUCTS.

Other fields for manufacturing endeavor lie within the realm of the dairy and livestock industries of the state. Opportunities along these lines should be comparatively numerous, as all classes of domestic animals thrive on the farms and ranges of Washington and a plentiful supply of milk can be relied on the year round. Dairying especially has experienced a phenomenal growth in Washington and today must be reckoned among the leading activities of the state. Butter, cheese and condensed milk manufactures amount to many millions of dollars every year. The State Commissioner of Agriculture in his most recent report says:

"Scarcely more than ten years ago, importations of butter from Oregon, California and the eastern states into the State of Washington were estimated in terms of millions of pounds annually. At the present time, the dairymen of this state are capable not only of supplying the home demand, but are likewise reaching out for outside trade.

"When it is considered that the population of the state has increased by fully fifty per cent. during the past ten years, it will at once be apparent that some tremendous forces have been at work in connection with the development of the dairy industry. The three principal factors which have entered into and influenced the remarkable change which has been accomplished in so short a period may be enumerated as follows:

"(1) The soils of the state have been found wonderfully well adapted to pasture purposes and to the production of maximum yields of forage crops.

"(2) Climatic conditions, which lend themselves in every respect to successful dairying.

"(3) The extraordinary growth of the commercial and industrial centers of the state, which have supplied a market ready and alert to absorb the continually increasing output of the Washington dairy farms.

"Dairying is no longer a haphazard industry. It is a highly organized business of its own and when conducted upon scientific principles and under favorable conditions, which are presented in

A Washington dairy farm. Additional condenseries, cheese factories and creameries will encourage the establishment of more like this.

this state, offers a field of industry uniformly satisfactory and profitable."

FACTORIES HAVE SPRUNG UP.

As a direct result of these conditions, there have been established in various parts of the state, numerous factories which conserve the dairy product and convert it into butter, cheese or evaporated milk. At the present time, there are 150 creameries, 21 cheese factories and 12 condenseries. For the year ending June 30, 1916, the total production of milk and cream for the state amounted to $7,100,047.93, representing 12,043,989 gallons of milk and 3,124,019 gallons of cream. During this same period the creameries used 14,931,285 pounds of butter fat, producing 18,333,474 pounds of butter, valued at $5,500,540, of which there was exported 1,374,880 pounds. Cheese factories made 1,346,033 pounds of cheese valued at $198,031 and the condenseries used 178,162,876 pounds of whole milk, producing 1,896,829 cases of condensed milk valued at $6,252,893, of which 1,444,404 cases were exported.

NEW ESTABLISHMENTS NEEDED.

In spite of such advancement, there is still a demand for more establishments to conserve the present products or to encourage dairying where its possibilities are far in advance of the present development. There is also considerable butter and cheese still shipped into the state from other sections. It is probable that about 75 per cent. of the cheese marketed in Washington is shipped from outside.

In response to the recent questionnaire of this department, thirty-eight communities of the state report openings for creameries, fifteen for cheese factories and fifteen for condenseries. In some of these communities, the present milk supply is being shipped to other points and handled by existing establishments; in others, there exists practically no market during normal times for their milk. Most of them represent that the presence of a local plant would greatly stimulate the dairy business in their localities and lead to the increase of milk production.

At any rate, it is certain that the greatest need of this state in connection with the dairy industry is the development of new dairy districts. In many instances, this may be accomplished by the establishment of factories to stimulate intensive milk production. Wherever condenseries or large creameries have already been located most beneficial results have been realized. Yet there are numerous other localities, still practically untouched, that hold the potentialities of the Mount Vernon, Kent or Chehalis districts. Along with such factories are needed men or companies with sufficient capital and patience to take the necessary time to educate the farmers as to the best kind and quality of cattle, proper methods of feeding, handling milk, etc. The history of many dairy centers proves that such efforts pay and that remarkable industrial changes can be brought about by those who act as leaders in the matter of building up the farming communities surrounding their plants.

OTHER LIVESTOCK.

Manufacturing depending on cattle and other livestock should be such as to encourage greater effort in their production. The demand for beef and other meats is increasing, as is well known, and to supply it is becoming more difficult. There are already several meat packing plants in the state and these are compelled to import large quantities of their stock from other states.

Nevertheless, Washington is holding its own in the matter of raising livestock of all kinds excepting hogs, as a comparison of the records for the past few years will show. Every March the county assessors take a census of all domestic animals kept. According to the 1917 report there was a total of 1,340,843 head of livestock in the state valued at fifty-four million dollars (or eight million more than in 1916), a falling off of 44,000 head during the year and accounted for chiefly by the smaller number of hogs produced. This is an increase, however, of 333,000 more than in 1911 and compares favorably with the estimated increase in population.

TABLE SHOWING NUMBER OF LIVESTOCK IN WASHINGTON DURING YEARS 1911, 1916 AND 1917.

(From Report of State Board of Equalization.)

	1911	1916	1917
Horses	264,639	270,964	272,280
Milch Cows	136,934	191,822	190,361
Other Cattle	125,064	262,798	272,399
Sheep—Goats	388,205	502,152	489,750
Hogs	93,000	156,338	116,053
Totals	1,007,841	1,384,074	1,340,843

WOOL PRODUCTION IMPORTANT.

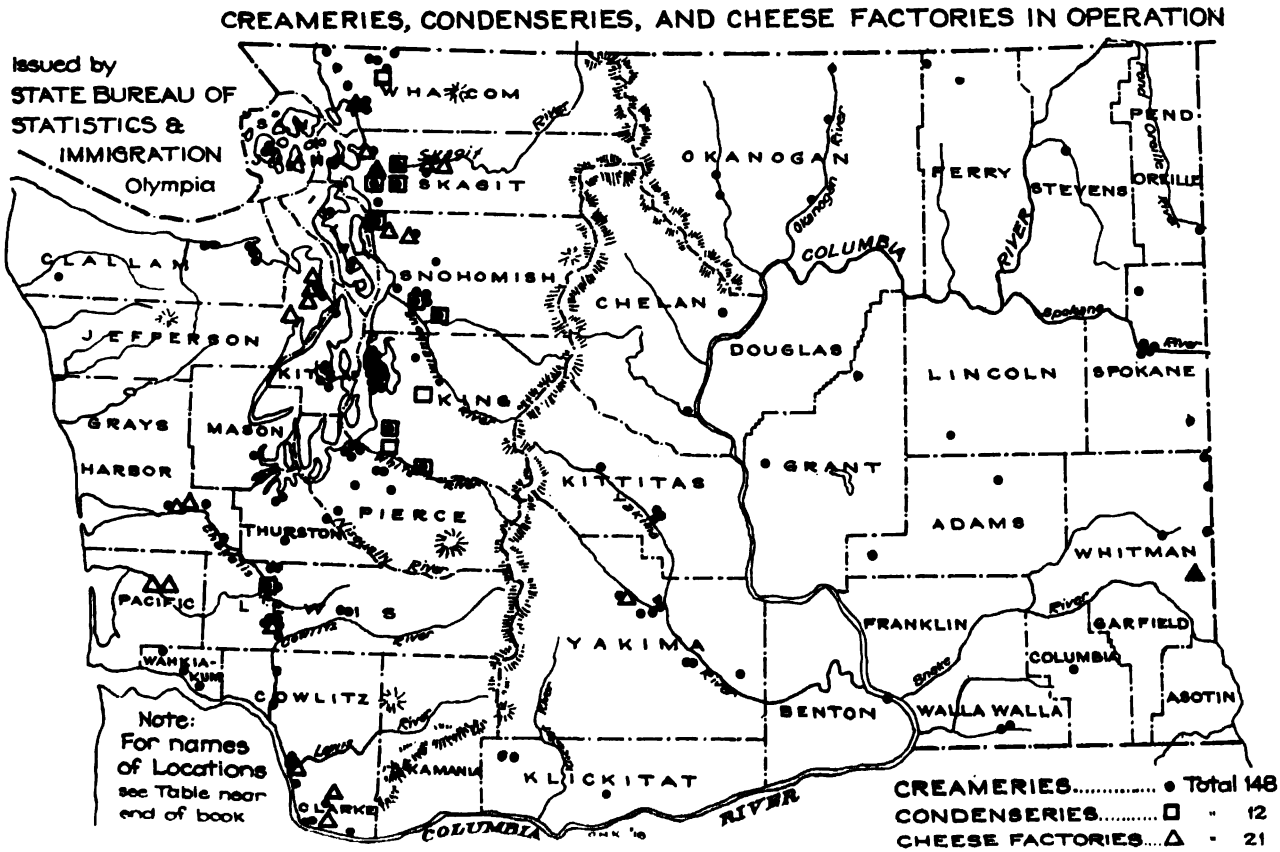
A half million sheep would naturally place wool among the important livestock products. This, with mohair, is a raw material which offers great industrial possibilities for the Northwest. The fleece of the Washington sheep is heavier than in any other state, averaging during the years 1914, 1915 and 1916, 8, 8.7 and 8.6 pounds respectively. Goat fleeces weigh from 3 to 4 pounds. The total wool product during the corresponding years was 3,638,000 pounds from 455,000 fleeces; 4,560,000 pounds from 525,000 fleeces and 4,750,000 pounds from 555,000 fleeces.

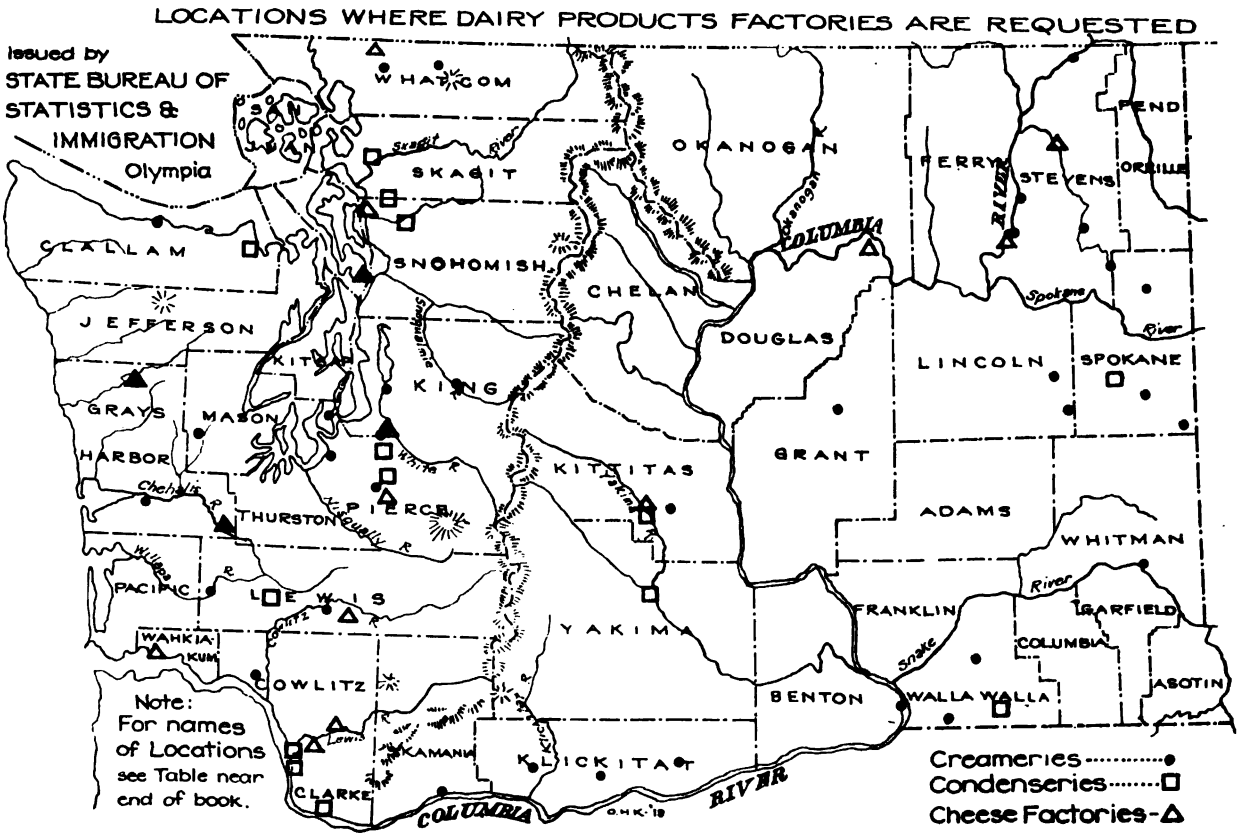
At the present time eastern Washington produces most of the sheep, and what few goats are raised are chiefly on the logged-off lands of western Washington.

The wool production has created demands for several wool scouring plants and woolen mills, in both eastern and western Washington. These merit careful consideration as indicating sites for woolen yarn and textile mills.

LEATHER GOODS.

Among other by-products of the livestock industry are many hides, but few local tanneries or leather working factories exist, while the demand for leather and leather goods far exceeds the supply. With the great quantity of tan bark grown in this state (see pages 87 and 167), and the liberal hide supply, it seems that a very good opportunity exists for the development of this industry.


CREAMERIES, CONDENSERIES, AND CHEESE FACTORIES IN OPERATION
Issued by
STATE BUREAU OF
STATISTICS &
IMMIGRATION
Olympia
WHATCOM
SKAGIT
CLALLAM
SNOHOMISH
CHELAN
OKANOGAN
FERRY
STEVENS
PEND OREILLE
JEFFERSON
KING
DOUGLAS
LINCOLN
SPOKANE
GRAYS HARBOR
MASON
PIERCE
THURSTON
KITTITAS
GRANT
ADAMS
WHITMAN
PACIFIC
YAKIMA
FRANKLIN
GARFIELD
COLUMBIA
WAHKIAKUM
COWLITZ
BENTON
WALLA WALLA
ASOTIN
KLICKITAT
CLARKE
Note:
For names
of Locations
see Table near
end of book
CREAMERIES..... • Total 148
CONDENSERIES..... □ - 12
CHEESE FACTORIES.... △ - 21


LOCATIONS WHERE DAIRY PRODUCTS FACTORIES ARE REQUESTED
Issued by
STATE BUREAU OF
STATISTICS &
IMMIGRATION
Olympia
WHATCOM
SKAGIT
CLALLAM
SNOHOMISH
JEFFERSON
KITSAP
KING
GRAYS
MASON
HARBOR
THURSTON
PIERCE
PACIFIC
LEWIS
WAHKIAKUM
COWLITZ
CLARKE
OKANOGAN
CHELAN
DOUGLAS
KITTITAS
YAKIMA
BENTON
KLICKITAT
FERRY
STEVENS
PEND
ORILLE
LINCOLN
SPOKANE
GRANT
ADAMS
WHITMAN
FRANKLIN
GARFIELD
COLUMBIA
WALLA WALLA
ASOTIN
COLUMBIA RIVER
Note:
For names
of Locations
see Table near
end of book.
Creameries
Condenseries
Cheese Factories

CHAPTER XV.

POSSIBILITIES FOR TEXTILE MANUFACTURING IN WASHINGTON.

BY GRACE G. DENNY,

Assistant Professor of Home Economics, University of Washington.

Besides the advantages which Washington offers for manufacturing in general, there are certain ones that are peculiarly adapted to the textile industries. For one thing, a moist atmosphere is necessary for the satisfactory spinning of all fibers. When moisture is not present in the air it must be supplied artificially. Such condition is well satisfied in this state for the climatic conditions of some parts of Washington are almost identical with those of the great textile manufacturing districts of England and Ireland.

Then, an abundance of pure water, free from mineral constituents, is necessary for the satisfactory scouring and dyeing of wools. Chemically softened water is employed in some mills in other states, but in Washington, where an almost unlimited supply of pure mountain water is available, this is unnecessary. The composition of the water is also of first importance in the retting of flax as will be explained later.

The most difficult question in a new industrial community is the one of supplying skilled labor. In the middle west and west this problem has been solved by taking young people in the local community from other occupations and re-educating them. In Washington the difficulty might best be overcome by establishing in the schools vocational courses that would prepare for skilled operative work in textile mills as the demand for them becomes apparent.

Another important advantage enjoyed by the West is the condition of the factory worker. He is usually healthier, more self-reliant, and more intelligent than such employes in large industrial districts in the east. The mild climate makes out-of-door living possible. The free and independent spirit of the country encourages self-reliance. There is no loss of efficiency because of violent extremes of heat and cold. Easterners com-

ing to the Coast find their working capacity greatly increased in an atmosphere that conserves their nerve force. The 8-hour law for women and the minimum wage law ($8.90 per week for manufacturing) also tend to create a higher standard of living.

COTTON AND SILK MANUFACTURING.

The manufacture of cloth from cotton and silk has not yet been established upon the Pacific Coast, but the favorable climatic conditions, the abundance of cheap power, and the fact that cotton could be transported here at a low cost via the Panama canal and that much of the raw silk from the Orient passes through Puget Sound ports on its way to eastern manufacturing centers, suggest that these branches of the textile industry may be profitably developed in the future.

WOOLEN MANUFACTURING A BASIC INDUSTRY IN WASHINGTON.

The possibilities for woolen manufacturing are much greater, for the making of woolen goods is a basic industry in Washington, just as lumber and fish canning are basic industries. According to the Department of Agriculture Yearbook 1916, 555,000 fleeces are credited to Washington which amounted to 4,750,000 pounds of wool in the grease.

The following figures show the production of wool in the three neighboring states. Montana is a close second to Wyoming, the largest wool producing state in the Union:

	Number of Fleeces 1916	Average Weight per Fleece in Pounds	Raw Wool Product in Pounds
Montana	3,150,000	7.8	24,570,000
Idaho	1,980,000	7.6	15,000,000
Oregon	1,760,000	7.5	13,200,000
Washington	555,000	8.6	4,750,000

While Washington does not rank first in the production of raw wool, she may draw from these large wool producing states where, aside from the mills in Oregon, there is practically no manufacturing done.

Wools produced in the United States are not as fine as imported wools, because sheep growing in this country has been directed largely toward the production of mutton, in which there is more profit and less work than in the wool itself. Lincolns and Cotswolds have been bred rather than Merinos, because the last (the best wool bearing animals) do not produce the best or the most mutton. Growers find it more profitable to shear the lambs and then dispose of them for meat and hides than to keep them for shearing purposes. Much of the wool is pulled, *i. e.*, chemically loosened from the pelts of the slaughtered animals.

For high grade cloth this native wool must be blended with finer wools. For heavy fulled goods such as mackinaw cloth the domestic wool is suitable. The need for soft water in the scouring and dyeing processes has been pointed out.

Besides raw material there must be an immediate market for a large part of the product. What sort of market for woolen goods do we find in the Pacific Northwest? The chief demand is for a heavy, coarse grade material such as mackinaw cloth and other coatings and heavy warm blankets for loggers and miners. This is true of Alaska as well as of the Northwest states. It is obvious, then, that the first needs will not be for fine and delicate fabrics. The making of coarse cloth requires less skill and entails no losses from fashion changes. It is this class of goods that the small mills already operating in Washington and Oregon are producing.

The most crying need at present is for more wool. The increased need for wool for our army and navy and for the allies make it imperative that we raise more raw wool. A sheep growing propaganda has been launched by a number of agencies with the hope that their slogan, "more sheep, more wool" may be realized. An increased production of Angora goats has also been advocated. The meat may be used as mutton and the skin is more valuable as leather than that of the sheep. The fiber is long, lustrous and strong. A very fine grade of mohair has been obtained from Angora goats in the Pacific Northwest.

A leading textile journal has advocated the production of wool under contract to the manufacturer, just as the canners of

SHEEP GRAZING ALONG THE SNAKE RIVER.

Wool growing is a leading industry of eastern Washington, providing abundant material for textile mills.

fruits and vegetables now arrange to take over the entire crop of a certain number of growers. If, as in England, the small farmers should each keep ten or a dozen sheep, and sell the wool, the situation might be improved.

A phase of the wool industry which has been scorned and misunderstood, is the re-manufacture of wool, *i. e.*, the separation of the fibers from cloth, either old or new, and scouring, respinning and weaving it into cloth again. The use of the term "shoddy" has been unfortunate in this connection. Because of the shortage of wool, occasioned by the war, the government has been obliged to introduced re-worked or "reclaimed" wool into blankets and soldiers' clothing. Since the government has given approval to the conservation of rags and the utilization of shoddy, it may now be possible to popularize these products.

It is certainly a patriotic measure, especially today, to supply the country with warm clothing. While it might be untimely to propose the erection of woolen mills on a large scale in Washington, the history of successful business enterprises shows that, with small beginnings and a patient willingness to expand as the market grows, an industry of this kind may be soundly established.

A number of small woolen mills located in western Washington, if operated wisely should develop into good paying investments.

LINEN MANUFACTURING UNDEVELOPED IN AMERICA.

The making of linen cloth is one branch of textile manufacturing which has not been developed to any extent in America. We have produced flax, but principally for the seed.

In 1915 the Department of Agriculture estimated* that of of some 3,000,000 acres in flax, only 2,000 were devoted to fiber flax. This comparatively small quantity has been utilized for binder twine. The report says, "The amount used in making yarn for weaving purposes is neglible."

There are two varieties of the flax plant, differing in methods of cultivation and in the product.

* The Development of an American Linen Industry—U. S. Dept. of Commerce. Special Agents Series No. 122, 1916.

Seed flax is sown sparingly. It is a slender, single-stemmed plant, branching profusely at the top and yielding many seed capsules. This flax seed or linseed is crushed to produce linseed oil, which is used in many industries, chiefly in the preparation of paints and varnishes. The residue makes linseed cake, a valuable cattle food. The stalk contains short, coarse fibers, known as tow, which are capable of producing coarse yarns for bagging, toweling and other low-grade goods. It has not been utilized, however. Vast fields of flax straw have been burned each year, while we have been importing linens from Ireland, Belgium, Russia and Germany. At present, some of the waste fiber is being converted into rugs, such as the Klear flax rugs made in Duluth, Minnesota. Quantities of straw are utilized in making oakum, a material used for insulating purposes and a small amount is used for upholstering. Yet, the conservation of waste flax straw has not proceeded far.

The fiber flax variety is sown thickly. It grows up straight and tall, producing much stalk and little top. Here, flax seed is the by-product.

In America this is grown more sparingly than the seed flax because generally the latter is an easier crop to produce and the machinery for using it less expensive, while a ready market is not wanting.

SUCCESSFUL FLAX GROWING IN WASHINGTON.

To grow fiber flax successfully the proper soil type, selected seed, favorable climatic conditions and careful methods are necessary. A government expert has pronounced western Oregon and western Washington the equal of Belgium for the growing and retting of flax.

Fiber produced in the Willamette valley in Oregon was awarded the highest prize at the Centennial Exposition in Philadelphia in 1876.

Dr. A. W. Thornton of Ferndale, Whatcom county, Washington, has carried on experiments in flax growing for over 25 years, acting at one time as special agent for Mr. R. C. Dodge in charge of fiber investigations of the Department of Agriculture. Dr. Thornton was asked to send some of his flax to a

mill in Belfast where it was made into yarn. The manufacturer wrote the following: "The flax is eminently adapted for thread making or warp yarn and spinning purposes. It is exceedingly strong and works well in the machine. If the flax is grown and manipulated under proper conditions, on Puget Sound, we are convinced that the cultivation of it would be of the greatest importance and in a short time rival the great Belgium district of Courtrai." Dr. Thornton has made flax growing investigations in thirteen counties that are tributary to Puget Sound. He has distributed pedigreed flax seed and directed the farmers in different localities to sow small plots of ground and tend and harvest the flax straw. The climate, soil and quality of water have been found especially suited to the growth and retting of flax.

A large and comprehensive display of Puget Sound grown flax together with samples of flax grown in the famous Courtrai district in Belgium has been placed in the State Museum on the University of Washington campus.

THE MARKETING AND MANUFACTURE OF FLAX.

The work of Dr. Thornton is confirmed by extensive and successful investigation carried on in western Oregon where soil, climate and water are practically identical with western Washington. Thus, the first step, that of flax growing, has been satisfactorily demonstrated.

The problem of marketing the flax, the second step, is analyzed in the following statement from the United States Department of Agriculture. "Something more is needed to set the industry on its feet than a body of farmers to undertake to grow the plant for fiber. There is a necessity for a class of skilled workers who will come between the farmer and the manufacturer in carrying on the operations of retting and scutching. It is futile to expect the farmer to ret and scutch his flax. The farmer is hardly in a position to grow flax save in an experimental way, until he is sure of a market, and the manufacturer, that is, the spinner, is not in a position to make offers of purchases or to name a price, because he is not sure that the farmers can grow flax of the proper standard, or that he can afford to

purchase at any price for his particular manufacturing such flax as the farmer may produce. This simply means that what isolated farmers cannot accomplish alone must be accomplished by the establishment of little local industries. That is to say, capital must establish scutch mills in localities where flax may be profitably grown, farmers of the neighborhood agreeing to produce five, ten or twenty acres of straw each, under the directions, if need be, of the managers of the mills to insure the growth of a quality of straw that will give the proper standard of fiber."*

Provision for this intermediary between farmer and manufacturer is being made now in Washington by the formation of the National Flax Development Company which will operate in Washington, Montana and South Dakota.

The third step, manufacturing, is in the realm of prophecy. We are at present cut off from our supply of linen goods. After the war, flax fiber might be sent to linen manufacturers abroad, but it seems more logical to suppose that these experienced mill men would prefer to come to the source of the raw material and establish mills.

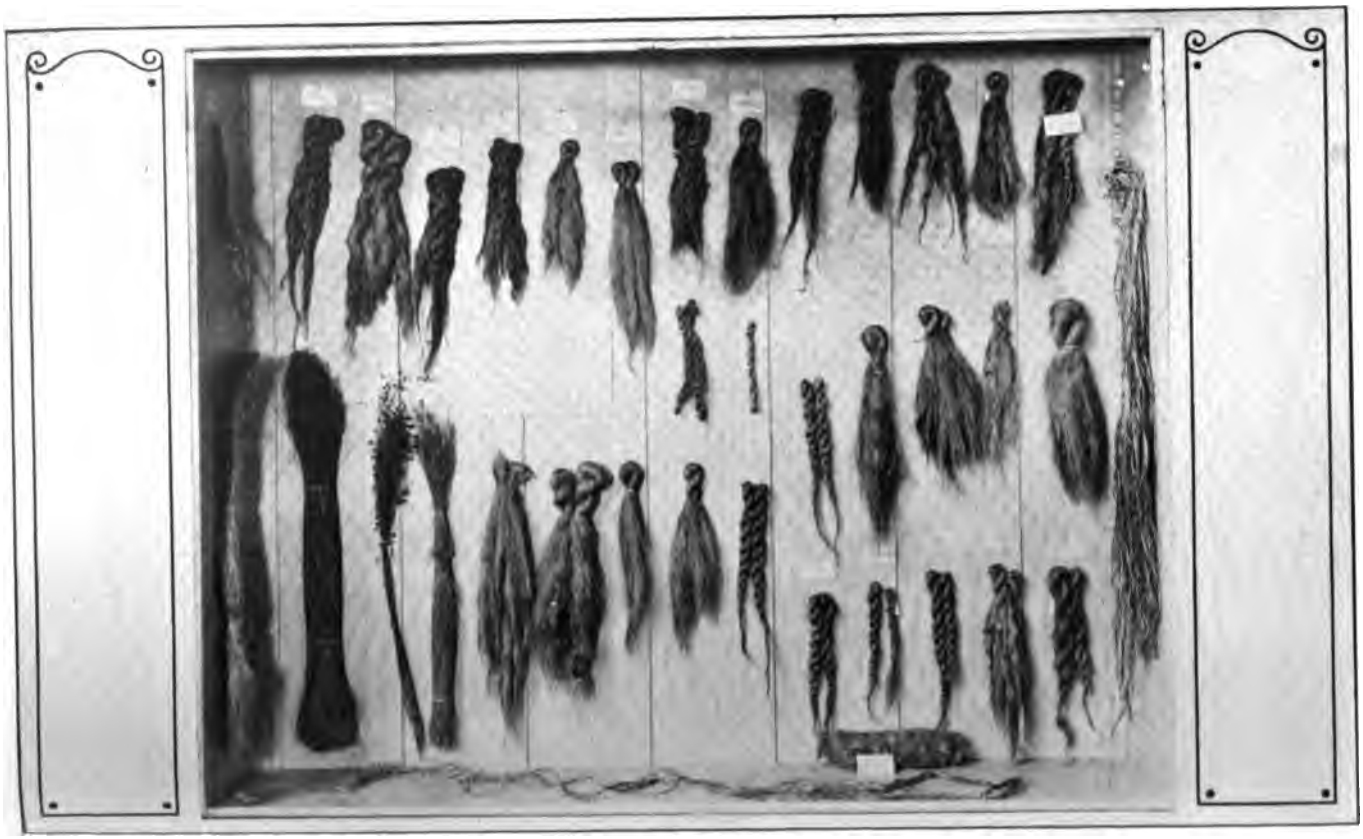
Lack of skilled labor is the most serious difficulty in the production and manufacture of linen but Dr. H. L. Deimel, president of the Deimel Linen Mesh Company of New York, San Francisco, Detroit and Montreal, says that "spinning labor is all that the United States must import. Other classes of labor can be developed with American labor."

The genius of the American engineer should be brought to bear upon this problem. With the invention of flax machinery the United States might control the future linen industry of the world, and no state offers better prospects for its development than Washington.

POSSIBILITIES FOR RAMIE MANUFACTURE.

The manufacture of ramie fiber is similar to flax. This plant is a species of nettle, native to the Orient. Experiments have proven that it may be grown and prepared in western

* U. S. Dept. of Agriculture—Farmers Bulletin No. 27—Flax for Seed and Fiber. Charles R. Dodge, 1895.



Washington-grown flax, compared with Belgian flax, in University of Washington Museum. Many parts of Washington are ideal for flax production

Washington. The fiber being resistent to moisture is suitable for ropes and hawsers. It may also produce a fine yarn not unlike linen.

The separation of the fiber from the plant stalk is difficult. So far hand processes only have been employed. This industry has great possibilities, not only with the native grown fiber but with raw material coming directly from China.

FIBER SILK A BY-PRODUCT OF LUMBER INDUSTRY.

In addition to the natural textile fibers already considered, there is an artificial or manufactured fiber, known as "fiber silk" or viscose, which is specially adapted to knitted fabrics. This is in reality a by-product of the lumber industry and the best of material for it exists in Washington in unlimited quantities.

Spruce wood pulp, when ground with caustic soda and treated with carbon disulphide, becomes a viscous fluid which may be forced under pressure through capillary tubes, coming out as fine filaments resembling those produced by the silk worm. These filaments, after being hardened by the action of ammonium sulphate, are united and twisted into yarns. This manufactured product is more lustrous, less elastic and less strong than worm silk. It dyes beautifully and costs, under normal conditions, from one-fourth to one-half as much as the natural silk.

Its greatest use is for knitted fabrics and if manufactured in this state, the product could be utilized in local and middle western knitting mills. It is also much used for designs and stripes in cloth, so would provide an additional material for future textile mills on this Coast.

KNIT GOODS INDUSTRY ALREADY ESTABLISHED.

The one textile industry with a good beginning in the Pacific Northwest is the manufacture of knit goods. There are ten small factories in the state doing successful business. The output consists of sweaters, bathing suits, caps and mufflers and a small amount of underwear. Some of the factories confine themselves to the wholesale trade but many have made their start by selling directly to the consumer. Most of the product is sold locally, but a trade in middle western states is being built up. Eastern mills still supply the stores of Washington

with much of this merchandise, so, the possibilities for developing local trade are still great. Competition is welcomed by these mills in the hope that this may become an important knitting center, thereby attracting related industries.

The first need is for a local dye firm which might supply the colors desired, particularly for sweaters. Large quantities of white yarn might be stored and dyed as market demands suggested. It is a hardship for the manufacturer to gamble on colors six months ahead. The second need is for spinning mills to supply the yarn. Western wools are known as high shrinkage wools. A conservative estimate would be from 40 to 70 per cent. It is wasteful to pay freight on wool plus grease and dirt when it might be scoured here and made into yarn which would be partly consumed by local mills.

POSSIBILITIES IN MANUFACTURE OF HOSIERY.

The manufacture of hosiery has not yet been launched. The need for a local dye establishment is again felt. A good business could be done in wool socks for loggers, miners and mountaineers. A coarse grade of cotton hose for men might precede the making of fine hosiery for women and children. This industry has been successfully carried on in Wisconsin. It undoubtedly has a future here.

CLOTHING MANUFACTURE.

Clothing manufacture in Washington appears insignificant when compared with large eastern concerns. Yet, when the youth of western industries, the relatively small population and the splendid opportunities for general growth are taken into consideration, the prospects for its future development are exceedingly hopeful. There are already factories located in Tacoma, Spokane and Seattle, specializing in working men's garments (overalls, mackinaws, pants and shirts). The Seattle factory consumes the product of the only woolen mill in the state (another is being started in Spokane). There appears to be a good market for cotton dresses and aprons made locally.

SMALL BEGINNINGS PREFERABLE.

In studying the growth of mills both in the east and the west, it appears that the successful manufacturer is invariably the man who is willing to start in a small way, make a good

product and patiently and persistently work for the creation of a market. The war is making business and industrial enterprises more resourceful and perhaps some of the present difficulties may be the means of releasing the genius for invention which will make possible a more extensive production.

Manufacturers who are attracted to Washington because of its natural resources may overcome any obstacles, provided they are willing to travel the same difficult path our forefathers took in developing the textile industries of New England.

Conditions in Washington are ideal for raising Angora goats; from their heavy fleeces an especially fine grade of mohair is produced.

CHAPTER XVI.

WASHINGTON'S MINERAL RESOURCES—NON-METALS.

BY HENRY LANDES,
State Geologist.

The State of Washington is fortunate in having within its confines a large variety of mineral products, which form the bases of many industries. It may be said that the state is characterized by an unusually high percentage of non-metallic products in contrast with the metals. The entire mineral production of the state during the past ten years has amounted to $13,722,579 annually. Of this about 94 per cent. has been derived from the non-metals. Taking the last census year, 1910, as an example, the production of non-metallic products in the state amounted to about $15 per capita of population. These products are vitally essential to the entire industrial life of the commonwealth. In most instances only a slight beginning has been made in converting the raw materials into useful objects. As our population increases, conversion of the non-metallic substances into the things necessary in everyday life will come to be one of our most prominent industries.

The primary divisions of our non-metallic products are as follows: (1) coal, (2) clay products, (3) Portland cement, (4) building stones, (5) sand and gravel.

COAL.

The returns from coal amount to one-half the value of the entire mineral products of the state. In this industry about 5,000 men are employed. The coal fields of Washington are among the best to be found in the Northwest. They lie principally in King, Kittitas, Pierce, Lewis, Thurston, and Whatcom counties. Nearly all of the coal areas are now served by railway lines, so that ready transportation is assured. The coal varies from a lignite through the various grades of bituminous coal. Prior to this time the principal demand has been for the bituminous coals, lignite being mined in a lesser degree. With the growing use of pulverized coal for steaming purposes, it is confidently expected that the lignite coals will be in far greater demand.

As a rule the coals of Washington are of easy ignition, produce a hot flame, and burn very freely. They have a small amount of sulphur and a moderate quantity of ash and water. The beds as a rule are thick and several of them frequently are mined at the same place.

Coal suitable for coking is mined at several places in the state, but especially in Pierce county. As a rule about 5 per cent. of the total coal mined each year is converted into coke. The coke is of a satisfactory quality and sells in the market for a good price.

The annual production of coal in Washington has been about stationary for a number of years. The principal foreign competitor of coal is oil, from California and elsewhere. The chief local competitor of coal for industrial purposes is the abundant water power which the state affords. At the present time, the price of oil is rapidly rising and many industrial plants are now planning to use coal for fuel. It is probable that the output of coal will be greatly increased if the prices of oil continue to rise and it becomes increasingly difficult to obtain. The coals of Washington are quite satisfactory for all fuel purposes. There are large reserves of this fuel as yet untouched. There is no question but what any industry depending upon coal will be able to find in the coal fields of this state an ample supply for a great many years.

CLAY PRODUCTS.

There is scarcely a locality in the state where clays of different grades may not be found. The manufacture of common brick is widespread, being carried on in every community of consequence where brick is needed. The higher grades of clay ware are made in those localities where the best materials are to be found, convenient to transportation and not too far removed from the best markets. The annual value of clay products averages about $2,000,000. About one-fourth of this is from the sale of common brick which are made at a wide variety of points.

Following common brick, in order of monetary value, we have sewer pipe, vitrified brick, terra cotta, fire-proofing materials, front brick, pottery, and drain tile.

WASHINGTON'S BLACK DIAMONDS.

No. 1. Large coal mill at Renton. No. 2. Cooling belt of a briquetting plant where fine coal is conserved.

The chief competitors of clay wares have been lumber, cement, stone and steel. Because of the increasing use of reenforced concrete in structural work the production of common brick is about stationary. There has been a notable increase from year to year in the production of vitrified brick, fire-proofing and terra cotta, as well as sewer pipe. The increased manufacturing of these things is largely due to the rapid and permanent growth of our cities where such materials are vitally necessary. The growing use of drain tile is due to the reclamation of the swampy areas where the soils are too valuable to be longer neglected. The manufacturing of clay wares represents an industry which becomes increasingly important with the growth of population. As is usual in a new community, only certain basic things were made at first, such as common brick. With the development of the towns and cities there came a demand for front brick, terra cotta, fire-proofing, paving brick and sewer pipe. As the state increases in population and wealth there will be an ever growing demand for the higher grades of clay goods, such as pottery, art goods, and those products of maximum value. Within the state there are deposits of clays suitable for the making of wares of all kinds and descriptions. With fuel convenient and an active and expanding demand for the products, it is evident that the manufacture of clay goods will soon come to be one of the greatest, if not the most important, of the manufacturing industries in the state along mineral lines.

The clay wares now manufactured are made from a wide variety of clays. Some of the clays are secured at the surface where they are essentially a part of the soil. In the northern portion of the state most of the clays are of glacial origin, while in other localities the surface clays have been formed by the decomposition of the bed rock. Except for common brick a large percentage of the clay products are made from clays derived from the bed rock formations. In some instances the clays are taken out of the great beds by the usual quarry methods. In other places the different varieties of clays are secured from the strata at points considerably under cover by methods of underground mining.

On the whole, the clays of the state are essentially inexhaustible. Some of the finer grades of clay are as yet practically untouched, because of the slight demand that has existed for the higher grades of ware. As the population of the state enhances in number and in wealth, those manufactured articles now brought from without will be made in Washington in an ever growing quantity.

PORTLAND CEMENT.

The materials used in Washington in the manufacture of Portland cement are limestone and clay. Limestone occurs in all of the counties along the northern boundary of the state and in Chelan, Skagit, Snohomish, and San Juan counties as well. Clay suitable for cement making is very widespread in occurrence and is much more abundant than limestone. For a number of years all of the cement that was used in the state was brought from elsewhere, much of it from Europe and some of it from the eastern states and California. The first cement in the state was manufactured in Skagit county, at Concrete, in a plant which began operations in 1907. At the present time there are two factories at Concrete, one at Bellingham, one near Spokane and one at Metaline Falls, in Pend Oreille county.

The annual production of Portland cement now amounts to nearly $2,000,000. For a number of years it has not been necessary to import any cement and the five plants in the state make an ample amount for local use. The opportunities for the establishment of other plants are excellent as far as the location of desirable materials is concerned. The demand for cement is growing with great rapidity because of its increasing use in highway construction and in re-enforced concrete work. It is an industry which will always be a growing one as long as the state increases in the number of people, and as long as great projects of engineering must undergo construction.

BUILDING STONES.

Building stones in an increasing quantity have been used since early days in the settlement of the state. The use of building stones has suffered in a degree because of the active competition of lumber, cement and brick. The principal build-

ing stones that are used in the state are granite, sandstone and basalt. Granite is secured very readily in the northern counties of the state and quarries are in operation around Spokane and at two or three points on the Great Northern railway in Snohomish county. While sandstone occurs in many localities, quarries to obtain it have been opened up chiefly near the cities of Puget Sound. The best sandstone quarries today are those at Tenino, in Thurston county. Other quarries are near Wilkeson, in Pierce county, Chuckanut, in Whatcom county, and on some of the San Juan islands.

Basalt is an abundant rock in southeastern Washington, where it is frequently used as a building stone, mostly for foundations. The primary use of basalt is in road building, where after crushing it is used in macadam construction. It is especially desirable in those localities where gravel can not be readily obtained for road surfacing. In addition to stone for building purposes it has always been in considerable demand for sea walls, jetties, and for use as rip-rap. The total production of stone in past years has amounted to about $200,000 annually. The supply of granite, sandstone and basalt will never be exhausted.

Marble of good grade occurs in the counties of northeastern Washington, and from time to time this material has been taken out and put on the market. Limestone has not been used as a building stone but has its chief use in the burning of quicklime, and in the manufacture of cement. The building stone industry is one that will always increase rather than diminish. For certain purposes no substitutes have been found that can replace stone. As our industrial enterprises become more numerous and the cities increase in size the stone industry will become greatly enhanced. At many localities new quarries will be developed and many new enterprises installed.

SAND AND GRAVEL.

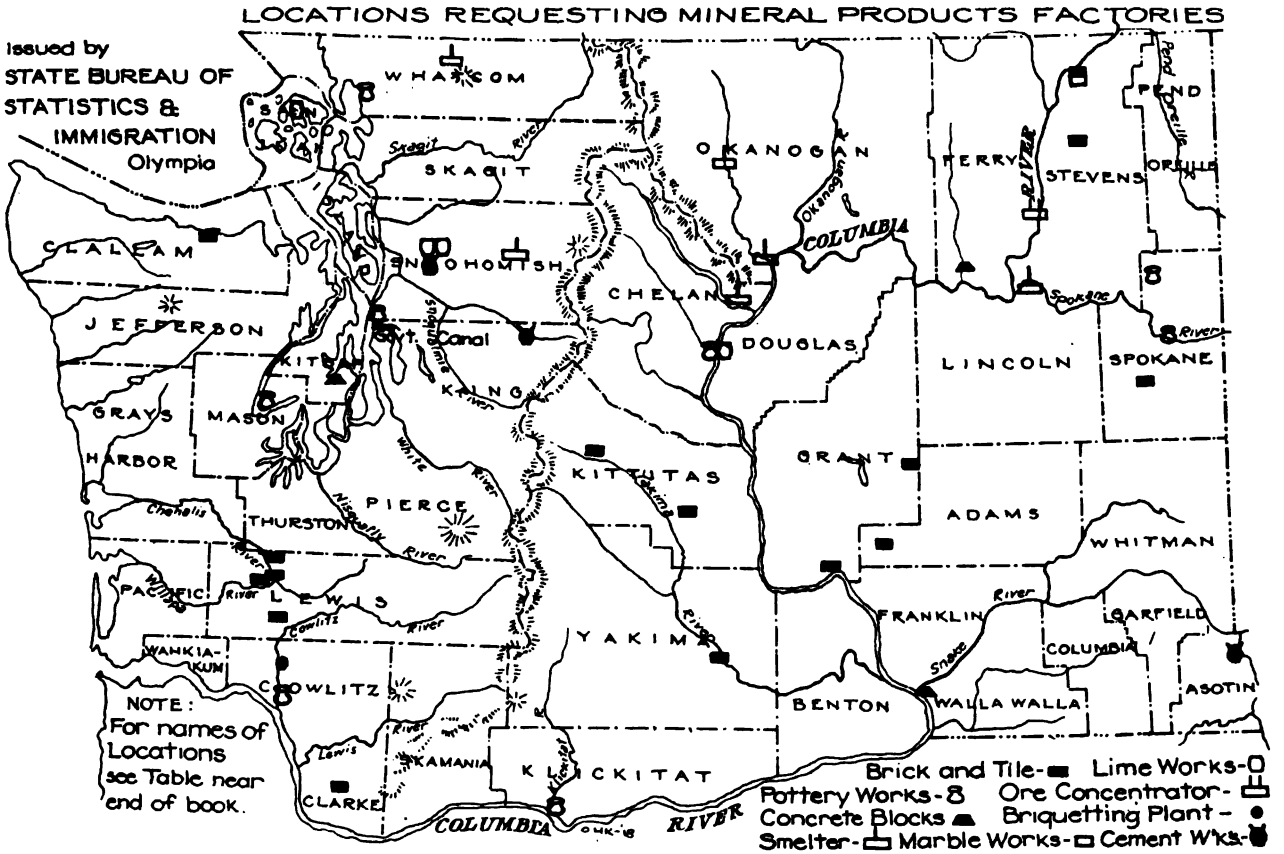
The annual production of sand and gravel for the past ten years has amounted to about $400,000. The use of sand and gravel is intimately connected with the fluctuations in the amount of building construction and the quantity used neces-

sarily varies from time to time. Because of the increasing use of cement in structural work and particularly in road building, the demand for sand and gravel has grown correspondingly. All over the state the highways are being improved and gravel is very generally used in road surfacing.

Sand and gravel are widespread in their occurrence in the state, the only localities where they are not abundant being in the southeastern and the southwestern corners of Washington. It so happens that in the vicinities of all of the large cities banks of sand and gravel are abundant and excellent materials are readily secured. The furnishing of sand and gravel is a well developed industry and many firms are engaged in this work. About Puget Sound the great beds of sand and gravel are substantially inexhaustible and available for all kinds of structural work. No industry which is dependent upon either sand or gravel need hesitate about being able to secure first class materials of this kind. In general the sand and gravel are cheaply secured and easily delivered wherever desired for use. As a rule the sand and gravel are very fresh and hard, and ordinarily very clean. Sometimes washing is resorted to, but frequently it is quite unnecessary.

There are many useful non-metallic products which have not been mentioned. Silica, in the form of diatomaceous earth, occurs rather frequently and some of it of excellent quality has been placed on the market. It is found abundantly in both eastern and western Washington and as its use widens it will become increasingly in demand. There are many mineral springs in the state from which water for table use is prepared for the market. Some of these are of marked medicinal value and many which are not now commercially utilized will be marketed in the future.

It is safe to say that all of the non-metallic products that have been mentioned, with others, are but in the infancy of their development and that in time to come they will play a prominent part in the industrial and commercial life of the state.


LOCATIONS REQUESTING MINERAL PRODUCTS FACTORIES
Issued by
STATE BUREAU OF
STATISTICS &
IMMIGRATION
Olympia
WHATCOM
SKAGIT
OKANOGAN
FERRY
STEVENS
PEND OREILLE
CLALLAM
SNOHOMISH
CHELAN
JEFFERSON
KITSAP
DOUGLAS
LINCOLN
SPOKANE
KING
GRAYS HARBOR
MASON
KITTITAS
GRANT
PIERCE
THURSTON
ADAMS
WHITMAN
PACIFIC
LEWIS
FRANKLIN
GARFIELD
YAKIMA
WAHKIAKUM
COLUMBIA
ASOTIN
COWLITZ
BENTON
WALLA WALLA
SKAMANIA
KLICKITAT
CLARKE
COLUMBIA RIVER
NOTE:
For names of
Locations
see Table near
end of book.
Brick and Tile-
Lime Works-
Pottery Works-8
Ore Concentrator-
Concrete Blocks
Briquetting Plant -
Smelter-
Marble Works-
Cement Wks-

CHAPTER XVII.

WASHINGTON'S MINERAL RESOURCES—METALS.

BY MILNOR ROBERTS,
Dean of the College of Mines, University of Washington.

All industrial growth depends to a greater or less extent upon metals. If a state is lacking in natural resources of the metals it must look elsewhere for at least a limited supply of them. If it possesses the metals in useful quantities or is a center for tributary regions which have large amounts of them, the possibilities favoring its industrial advancement are greatly enhanced.

FAVORING CONDITIONS.

Washington not only has a liberal supply of metal resources of its own but is adjacent to territory where other very rich mines are located. Then, too, certain favoring conditions, some of which are natural and others due to the state's development, exert an encouraging influence upon the mining of its own minerals and place it in position to enjoy the full advantage of proximity to other productive territory. These conditions, which have been quite fully discussed elsewhere, include especially: a strategic location and the resulting extension of transportation facilities; broad trade relations with the outside world; a more or less advanced stage of development in certain other important industries; and, what is of prime importance to mining and metallurgical development, an unlimited supply of cheap power.

WASHINGTON A CENTER FOR ORE TREATMENT.

The effect of these and other favoring conditions of a like nature is to make Washington a center for the treatment of ores brought from widely scattered sources. The Pacific Coast states, British Columbia, Alaska, the Orient and South America are the principal regions from which regular shipments are received. In addition to the primary operations of smelting crude ores and concentrates, the Northwest is building up secondary industries of a metallurgical nature, such as refining metals and treating scrap materials. Judging from the present outlook metallurgical operations are likely to outstrip the purely mining

side of the mineral industry within the actual borders of the state, unless ore deposits now wholly unknown should come to light. Adjacent districts will furnish large quantities of ores for years to come, in addition to the local supplies.

PRINCIPAL METALS MINED.

Gold, silver, copper, lead and zinc are the principal metals mined in Washington. The amount of each varies considerably from year to year, but for the past few years the total output of these five metals has been increasing. Most of the gold comes from quartz mines located in the northern half of the state, the Mount Baker district and Republic being the principal producers. Okanogan, Stevens, Chelan, Kittitas, Snohomish, King and Clallam counties also yield gold. The total gold production for 1916, according to advance figures prepared by the United States Geological Survey, was 27,944.06 ounces.

In passing, it is interesting to note that most of Alaska's gold output is received at the United States assay office in Seattle, the receipts since the establishment of the office being a quarter of a billion dollars' worth of the yellow metal.

Silver is obtained from thirteen counties, along with the gold, copper, and lead. The total production for 1916 was 335,121 ounces.

Copper is widely distributed throughout the mining districts of the Cascades and northeastern Washington. Outcrops of the sulphides, especially chalcopyrite, are found at very numerous points, a fact which has resulted in the location of thousands of claims. The great majority of these locations are in mountainous regions, difficult of access, where only a very rich ore could be worked at a profit, unless the deposit proved to be of such size as to warrant building a transportation system especially for it. Snohomish, Stevens, Okanogan, Ferry, Pierce, Skamania and Asotin counties are active in copper, while in Chelan, Skagit, Whatcom, Pend Oreille and other counties explorations are being carried on. The state's yield in 1916 was 2,645,022 pounds. The chief center of copper smelting for the Pacific Northwest and Alaska is Tacoma, where the Tacoma Smelting Company smelts and refines one-twelfth of the copper output of the United States.

Lead has been mined in the state in considerable quantities at times in the past; in the last two or three years several mines in northeastern Washington have again brought up the production of lead, the total for 1916 being 5,399,274 pounds. Lead mining has been stimulated by the re-opening of the Northport smelter which lay idle for several years.

The production of zinc has risen along with that of lead, reaching a new high figure of 1,693,734 pounds in 1916. The

UNDERGROUND WEALTH.

Interior of a tunnel in mining district north of Spokane, showing how the ore has been taken out and timbers placed to prevent cave-ins as the work proceeds.

remarkably high prices for zinc which prevailed throughout 1916 gave a handsome margin of profit which cannot be attained during the year 1917.

MINOR METALS.

Arsenic in the form of arsenopyrite is found in several Washington camps. It was smelted for a number of years at Everett

from the gold-silver ores of Monte Cristo, Snohomish county. Later the Everett plant was abandoned and a new one erected at the Tacoma Smelter where refined white arsenic of the highest grade is now made.

Antimony mines have been opened in King, Chelan, Okanogan and other counties, from most of which a few shipments have been made, although none of the properties have become regular producers. The Okanogan ore was smelted in a furnace located at Tonasket, while a plant at Seattle treated ores from this state, Alaska and elsewhere.

Mercury ore is found in Lewis and Chelan counties. Quicksilver was produced in 1916 in a furnace at Morton from cinnabar of excellent grade which was mined nearby. Development of the properties near Blewett is taking place.

Tungsten has been known for some years in Kittitas county and at Deer Trail, Stevens county, where some production has been made in the past. When the price of this uncommon but peculiarly useful metal rose with the war demand, the hills were scoured for wolframite and scheelite. New deposits were found and forgotten prospects were opened anew, some of which are being developed further.

Tin was discovered years ago near Spokane but the deposit was not extensive. Alaska tin is smelted in an electric furnace at Seattle.

Molybdenite is an unknown mineral in many parts of America, but in Washington it can be found at numerous points in the Cascade Mountains and in the northern tier of counties. Most of the occurrences are either sporadic and small, or else of too low grade to be worked. Near Lake Chelan, however, the Crown Point mine developed a vein of high grade molybdenite, erected a mill on its property and operated for several seasons. Other properties in the state are likely to make some production.

IRON ORES.

Washington's iron ores have been worked on a small scale at different times in the past. Recently the old Irondale blast furnace plant has been rebuilt by its present owners, the Pacific Coast Steel Company, and the smelting of iron has begun again.

The company is purchasing ores from all available sources, a plan which will result in determining how dependable the iron ore deposits of the Northwest coast really are. The Pacific Coast Steel Company has operated a steel plant and rolling mill in Seattle for many years with great success, buying scrap iron from South Chicago, Birmingham and the Orient. Three open-hearth furnaces are kept in constant operation.

An electric furnace for the treatment of iron ores was erected last year in Skagit county. Manganese ores from Lake Cushman in the southern part of the Olympic range have been smelted recently in Tacoma at the plant of the Bilrowe Alloys Company. The Seattle Smelting Company is making ferromanganese from Northwest ores in electric furnaces located at Van Asselt Station, Seattle, while the Rothert Process Steel Company is nearly ready to produce electric steel. Other plants of a like nature are being definitely planned in the state.

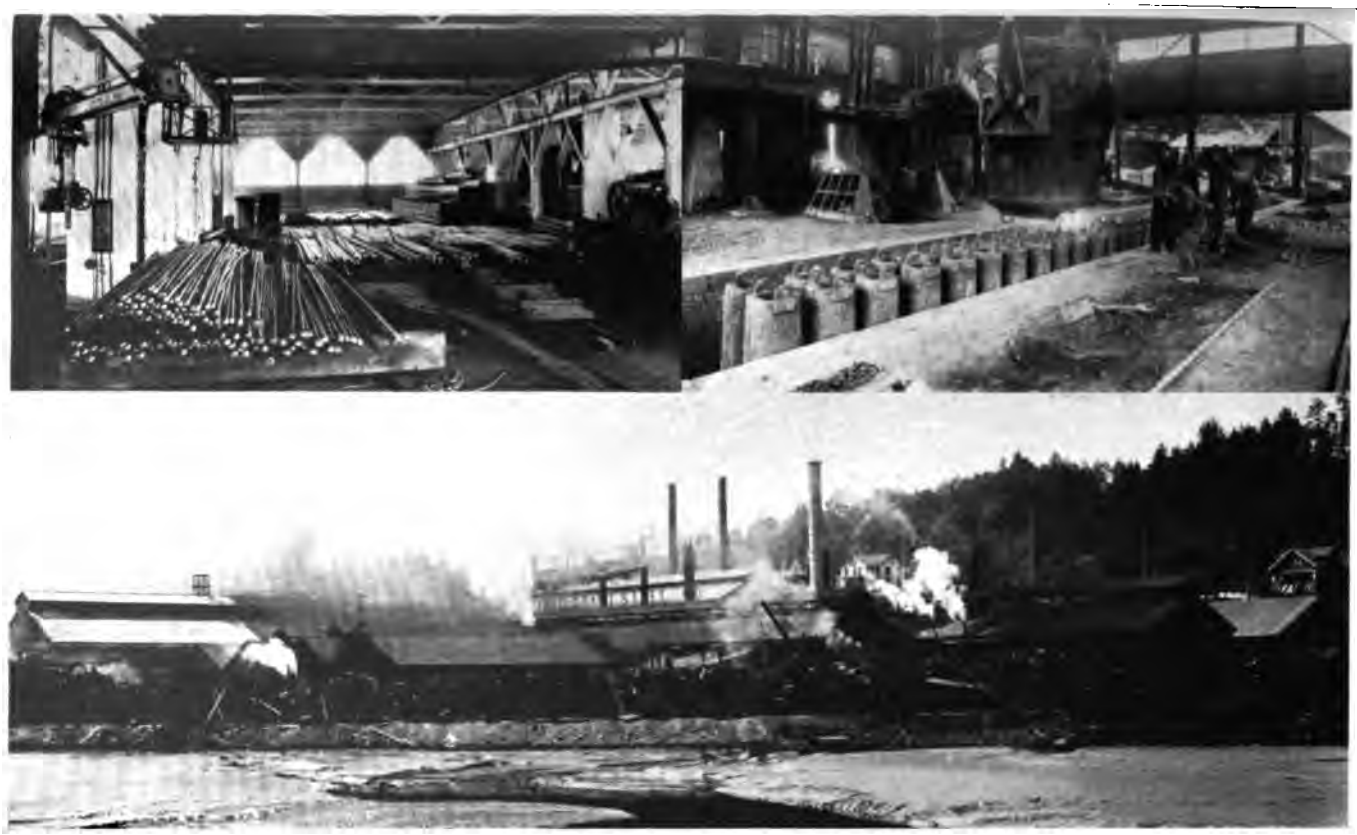
According to a recent announcement by prominent mining operators a large plant is to be erected in the immediate future near Seattle for the complete treatment of iron through the several stages from raw ore to finished products of steel. The project will include blast furnaces, a steel plant, rolling mills, by-product coke ovens and the usual accessory works. Washington coal will be used and the supply of iron ore will be drawn from this state, British Columbia, Alaska and other Coast sources.

TOTAL OUTPUT.

To summarize, the total value of the gold, silver, copper, lead and zinc mined in Washington during 1916 was $2,048,350. For the same period, however, the Tacoma and Northport smelters produced a far larger total made up of copper, lead, gold and silver which was mined in part in districts outside the state. The grand total of metallic production would include also the steel and the minor metals above described.

INDUSTRIAL RESEARCH.

Investigations conducted for the past year by the Bureau of Industrial Research of the University of Washington have developed many new facts concerning the iron smelting situation and have served to summarize the information as to deposits of iron ore in the Pacific Northwest, British Columbia and Alaska.



SCENES FROM THE STEEL INDUSTRY AT SEATTLE.

No. 1. Part of 400,000 rod order manufactured in 20 days. No. 2. Pouring ingots. No. 3. Large plant in operation.

The results are encouraging toward the establishing of an iron industry in this region. Metallurgical coke is being made from Washington coals in beehive and by-product ovens. Inasmuch as a large and growing local market exists for both iron and steel, the future of the industry in this state looks bright.

EXPERIMENT STATION AT UNIVERSITY OF WASHINGTON.

In 1916 the United States Bureau of Mines established one of its mining and metallurgical experiment stations at the University of Washington, to work in co-operation with the College of Mines. Six of the Bureau's experts located at the station are now engaged in studying the particular problems that are of the greatest importance to the mining and metallurgical industries in the Northwest and Alaska. In order to expedite the work of investigation the state has provided additional equipment for the laboratories of the College. The state is also supporting five fellowships, the holders of which devote their time for a year to solving problems arising within the state. A great step forward was taken with the establishment of the station by the federal government, and the appropriation by the state legislature of funds for investigating problems affecting these two basic industries, mining and metallurgy. The territory allotted to the Northwest station embraces the Pacific Northwest and the coast regions of Alaska. Sub-stations are maintained in Idaho and Oregon.

INVESTIGATIONS BY FELLOWSHIP HOLDERS.

The present fellowship holders, all of whom are required to be technical graduates with practical experience, are working on a number of important topics, the principal one being electro-metallurgy. For this industry a source of cheap and dependable power is a prime requisite and, as already stated, hydro-electric power is one of the state's greatest resources. This fact, coupled with the item of favorable location, makes it practically certain that electro-metallurgical industries will increase here. The electrolytic copper refining plant of the Tacoma smelter, electric smelting of tin ore, electric furnaces in iron works and other lesser operations are present examples that indicate the future possibilities.

The salmon and fruit canneries of the North Pacific Coast make a large quantity of tinplate scrap which ordinarily goes to waste. An expert of the Bureau assisted by a fellowship holder is now engaged in attempting to find a means of conserving this material. Another topic is the treatment of lead-zinc ores by electrical methods which, if they can be worked out successfully, will mean a vast saving.

The mineral resources of Washington are being thoroughly studied by another fellowship holder. All published articles which give information on the subject are being listed and indexed. A separate map of the state is being prepared for each mineral substance, showing all localities where each is found and the plants in which it is treated. Field studies will be made of prominent localities regarding which the reports are incomplete. Finally a summarized report will be prepared which will bring up to date all available knowledge of the state's mineral resources.

Methods of treating the ores and other crude materials will furnish the subject-matter of another report. The extensive knowledge possessed by the Bureau of Mines will be applied to local problems with the object of aiding development, reducing treatment losses and avoiding expenditures in directions which are not likely to lead to useful ends.

In preparing Washington coals for market, various processes are used at different mines, depending upon the particular requirements of each coal. Broad investigations into the nature, preparation and uses of coals in all parts of the country have been carried on by the Bureau of Mines, which will now undertake to give special aid to the coal industry in Washington. Under one of the fellowships a report will be made upon the local methods of treatment in order to give the Bureau a basis for giving detailed advice. The saving of by-products in coking, the use of powdered coal as fuel and the briquetting of coal are other topics to be taken up later.

SOURCES OF INFORMATION.

There are several sources of information regarding the mineral resources of Washington, some of which are readily available. The United States Geological Survey has published extensive

reports on those areas in the state which are of the greatest economic importance. A bulletin may be had from the Director at Washington, D. C., which lists all the known mineral occurrences in each state. A finding list, published anew from time to time and sent to the larger libraries, furnishes a quick means of locating articles relating to a particular mineral or locality.

The United States Bureau of Mines, although established for less than a decede, has already issued hundreds of papers, some of which describe Washington minerals and mines. The Washington State Geological Survey has published reports, bulletins, maps and a bibliography, which may be obtained from the State Librarian at Olympia.

Specimens of the principal ores, coals and useful rocks of Washington may be seen in the form of collections which are on exhibition at nearly all the accredited high schools in the state. These collections, which contain one hundred thirteen specimens each, were prepared in 1916 by the College of Mines and distributed free by the Extension Division of the University. A bulletin of ninety-six pages which accompanies each collection describes the specimens and their sources.

Inquiries regarding the mineral industry may be addressed to the College of Mines, University of Washington, Seattle.

ADVANTAGES APPARENT.

From the foregoing statements, it must be apparent to a manufacturer desiring to come to the State of Washington and engage in an industry requiring for its success a supply of mineral products, that the prospects are favorable for finding the necessary materials in Washington or for bringing them at minimum expense from neighboring territory, and that the facilities for working them into proper shape for utilization are being rapidly perfected. The expert advice proffered and the assistance in the form of investigation placed at one's command by state and federal authorities should be considered as further encouragement in undertaking any industrial enterprise of merit. Under such conditions the chances for failure are reduced to the lowest possible minimum.

CHAPTER XVIII.

FERTILIZER RESOURCES OF WASHINGTON.

BY CHARLES A. NEWHALL,
Consulting Chemist, Seattle.
Member American Institute of Chemical Engineers.

Not the least prolific field for industrial effort in the State of Washington is found in the utilization of the vast quantities of fertilizer materials which are at present being neglected, and in the more thorough conservation of those that are being either wholly or partially wasted. The value of such materials and the importance of using them to the fullest extent is especially emphasized today, when the usual sources for some of the elements are no longer available; so that the discovery of other supplies, or of appliances for obtaining them, will mean greater progress in the agricultural development of the country, and added wealth for the manufacturers who solve the problem of most cheaply extricating the elements from the materials containing them.

It is to point out some of the advantages which Washington offers for such work and to encourage, if possible, more activity along such lines on the part of those in a position to follow them, that the following paragraphs are written.

FERTILIZER ELEMENTS.

The fertilizer elements needed for plant growth are chiefly nitrogen, potassium and phosphorus. These elements the plant takes out of the soil and sooner or later the soil is exhausted, and can no longer sustain healthy plant life. To keep a soil fully productive the three elements must be put back into the soil in some form, whereby they may again be available for the plant.

These three fertilizer elements occur on the earth in many different forms and combinations, only a few of which are available for immediate use by the plant. It is not sufficient that a material simply contains potassium—for instance; this potassium must be in readily soluble or "available" form, so that the plant can use it. Great chemical industries have been built up

A kelp bed at Neah Bay. Annual kelp crop of Puget Sound is about 390,000 tons, offering great possibilities for the

for the purpose of converting "unavailable" fertilizer elements into "available" forms and combinations.

NITROGEN.

Nitrogen is the element most necessary to plant growth, and it is the most abundant of all the elements that go to make up the substance of the earth; yet only a very small portion of this nitrogen is available for fertilizer. The vast quantity of free nitrogen in the air is not "available" for plant use until it has been converted into a combined form.

The world's supply of combined or available nitrogen is strictly limited, and is being depleted far more rapidly than it is being replenished by the slow processes of nature. Hence, chemists have for years past been working on the problems of "nitrogen fixation," that is, of making available the free inert nitrogen of the air.

The solution of this problem has formed one of the most spectacular developments of modern chemistry. First worked out on a commercial scale by American chemists, and then put on a wonderfully successful commercial basis in Norway, this "nitrogen fixation" business has grown within ten years from a tiny plant to one of the world's greatest industries.

"ARC PROCESS."

Several processes for nitrogen fixation are now in use. The "Arc Process," whereby air is passed through a high temperature electric furnace, is dependent for its successful operation on cheap electric current—current costing not more than $10.00 per horse power year.

The "Arc Process" is technically quite simple and can be operated with a comparatively small investment in furnaces and plant equipment, outside of the investment in power development. The essentials for its successful operation are very cheap power, air, and some basic chemical, such as lime or soda. It can be worked to advantage on a small scale as an outlet for the "off peak" current from established power plants that derive their main income from the operation of public utilities.

A plant using the "Arc Process" is now purchasing the surplus current from the city of Tacoma power system, and

converts atmospheric nitrogen into commercial products. The power is sold by the city at a rate of $0.0015 per kilowatt hour.

CYANAMID PROCESS.

The second method of converting the inert atmospheric nitrogen into usable fertilizer form is the "Cyanamid" process. Immense quantities of cyanamid fertilizer are now made in many places in Europe and at Niagara Falls in Canada. The process is not absolutely dependent on very cheap power, as is the "Arc Process," though much power is used in making the calcium carbide, which is the substance used to fix the nitrogen.

High grade coke is now used exclusively along with lime in making calcium carbide. Charcoal could be used, however, and eventually this use is likely to provide an outlet for the charcoal obtained by the distillation of our lumber and logging waste. It is interesting to note, in this connection, that the numerous attempts to work up the timber waste by distillation have all failed, largely on account of inability to sell the charcoal. Good markets can be found for the distillation liquids, but this market does not furnish sufficient income to make a plant a commercial success; the sale of the charcoal would furnish the profit. Thus the commercial future of our wood-products industry is closely associated with the cyanamid industries.

NUMEROUS OPPORTUNITIES IN WASHINGTON.

Reasonably cheap power, lime, carbon in the form of high grade coke or charcoal, and air are the essentials for the production of fertilizer by the "Cyanamid" process. In Washington we have the makings of a great cyanamid industry, once the business is developed on broad gage business lines so as to include the wood waste industry. We have numerous locations where cheap power can be developed. We have great quantities of very high grade limestone, cheap fuel and a tremendous timber waste from which to obtain the carbon.

Turning to our natural supplies of available nitrogen, the coals of this state contain, on an average, approximately one per cent. of their weight in nitrogen. When the coal is heated to make coke or gas, the greatest part of this nitrogen can be

recovered in the form of ammonium sulphate—a valuable fertilizer material.

The gas works of our larger cities are now collecting many tons of this nitrogen, but in the coke ovens in the State of Washington great quantities of valuable nitrogen materials are being wasted. Eventually, in this state, as is now being extensively done in Germany, coal will be distilled for the nitrogen and the valuable oils and waxes. Some of our coals seem particularly adapted to this use.

FISH WASTE.

Washington's greatest contribution to the nitrogenous fertilizer supply is in the form of dried and treated "fish scrap" or

Cod-fish packing plant.

"fish guano." The greatest part of this guano is supplied by the whaling companies. One company was formed for the purpose of working up dog fish and other worthless fish.

The Pacific Products Company of Seattle and Port Townsend is working up the worthless fish as well as salmon cannery waste. Approximately 1,000 tons of prepared fish fertilizer is their annual output. Three and six-tenths tons raw fish make one ton fertilizer, this containing approximately 11 per cent nitrogen and 14 per cent bone phosphate.

For years the salmon canneries threw away a tremendous tonnage of scrap—some 40 or 50 per cent of the weight of the

fish—heads, fins, viscera, etc. Nowadays, much of this scrap is saved and, when properly treated, forms a very fine fertilizer material containing both nitrogen and phosphorus. Processes have been developed whereby it is possible for cannery men to partially cure their scrap and collect enough for shipment to a central treating plant.

Wet kelp contains on the average about 0.19 per cent. nitrogen and when dried, about 1.18 per cent., practically all of which is available as fertilizer material. At the present market value of fertilizer nitrogen ($5.35 per unit), the nitrogen in one ton of dried kelp would be about $6.31.

POTASSIUM AND KELP.

This brings us to the consideration of potassium, the second element needed for plant growth.

Kelp and several other sea plants contain relatively large quantities of potassium. Under the present abnormal conditions of the chemical trade, these plants can be worked at a profit for their potash content. Even under normal trade conditions it seems probable that Washington kelp can be worked at a profit to supply a local fertilizer market.

Raw kelp contains on the average 86.4 per cent. water, with only 2.8 per cent. potassium chloride (equal to 1.8 per cent. K_2O), 0.19 per cent. of nitrogen and 0.03 per cent. iodine. The balance is organic matter and salt (sodium chloride). The air dried kelp may run as high as 18 per cent. potassium chloride (11.45 per cent. K_2O) and the calcined kelp anywhere from 25 to 65 per cent. potassium chloride (15.8 to 41 per cent. K_2O). From the calcined kelp it is possible to get a very high grade potassium chloride—99 per cent. pure—(62.5 per cent. K_2O). Only about two-thirds of the total potash in the original kelp can be recovered in this high grade form and it is far too expensive for use in the fertilizer trade, but would find a market in the chemical trade.

Under normal conditions it has been conservatively estimated that dried kelp for fertilizer use would be worth about $12.00 per ton, and that over six tons of the green kelp must be harvested to make this one ton of dried kelp. Government experts

have estimated the annual kelp crop of Puget Sound to be about 390,000 tons, the greatest beds lying along the American shore of the Strait of Juan de Fuca and along Smith and San Juan islands. In addition to this, it is estimated that the kelp crop of southeastern Alaska from Dixon entrance to Chatham strait amounts to 7,833,000 tons. With this abundant supply of free material to be had for the harvesting, the industry offers an excellent field for men who can develop it along practical and scientific lines.

It has been suggested that the kelp industry could be combined with the fish waste industry, and both be worked to an advantage here in the North Pacific district. The same drying and handling equipment would serve both industries. It only remains to devise an efficient kelp harvester, suitable for rather small scale operations. This suggestion is worthy of careful consideration by engineering chemists and by men interested in the fish business.

POTASH FROM MINERAL SOURCES.

America is very rich in potash, but the greatest part of this potash is located in rocks, in combinations with silicon, aluminum and other elements. In this combination, the potash is insoluble and so it is of little or no commercial value. To be of value, potash must be in soluble form, such as the combination with chlorine or sulphur and oxygen. It is in these soluble forms that potash is found in the great Stassfurt deposits in Germany and in such form the potash is available for commercial use.

Our mineral potash supply may be classified under two headings; first, the saline deposits, and second, rock combinations. The saline deposits are relatively unimportant because of their small extent. By far the most promising source of potash lies in the second division, namely, the igneous rocks.

There is an incalculably great tonnage of potash in the feldspar, which constitutes one of the chief minerals in the granite rocks occurring in practically every district of the country. It is easily possible to get rock in quarry size operations that will run 10 per cent. potash. The pure feldspar which occurs in quantity in many places will run as high as 16 per cent. potash.

Tailings from certain gold and copper ores run very high in potash,—4 to 13 per cent. K_2O.

Until recently, no practical process had been perfected by which this potash could be separated and collected without excessive expense, but a short time ago the Riverside Portland Cement Company of southern California, in an endeavor to eliminate the dust from their plant, reached a solution. The dust from all parts of the cement plant is drawn through chambers

Whale products plant at Grays Harbor.

highly charged with electric current and every part of the dust is precipitated, leaving only inert gas to escape into the air.

Before the installation of the process, the cement company was throwing several hundred tons of dust into the air every 24 hours. Now it is found that this dust which is collected by the electrical process contains practically all of the potash that occurred in the original raw materials.

This dust contains approximately 1 per cent. of potash. It is now being run back into a special kiln where the potash is volatilized. The potash leaves the kiln along with some dust and is collected in the electric precipitation chambers. This dust contains 10 per cent. potash, in the form of potassium sulphate, and is now finding a ready sale to the very orange growers who before attempted to shut down the cement companies because

the dust injured their orchards. About 4 tons of dust containing 10 per cent. potash is now being produced each day. All this means that the cement plants of the country will eventually be the potash producers, for it is entirely feasible for cement plants to select raw materials that run high in potash; in fact many of the plants now in operation are throwing away many tons of valuable potash-bearing dust every day. The cement plants of this state are throwing away enough potash to more than supply local potash requirements.

The experience in Riverside has shown conclusively that the installation of the electric dust collectors is a ing proposition and will return a good percentage on the investment. The value of the dust as a raw material more than pays for operating the process and allows for interest and depreciation on the investment. This leaves a clear profit on the income from the sale of the potash bearing dust.

At the present time there are four cement plants on this continent that are recovering potash. It has been shown that raw materials containing as low as 0.1 per cent. potash can be worked and a satisfactory recovery made.

Great quantities of granitic rocks, copper and gold ores occur in the State of Washington and there is not the least doubt that the future development will show that these rocks contain potash in quantities. The commercial development of the potash bearing rocks depends entirely on the cost of transportation of such rock to the existing cement plants; only the future can tell how far this development will extend in this state.

PHOSPHORUS.

Washington has no phosphorus bearing rocks in commercial quantity, so far as known. The phosphorus that occurs with the nitrogen in the "fish scrap" can be our only contribution. In Idaho, however, vast quantities of phosphorus rock—one of the greatest deposits in the world,—will eventually supply the needed material for a complete fertilizer industry.

Thus, with the Idaho phosphates and our own potash and nitrogen resources, we have the basis for a great fertilizer industry.

CHAPTER XIX.

MISCELLANEOUS MANUFACTURING POSSIBILITIES.

In addition to the opportunities described under the different general headings in the foregoing chapters, there are openings for many miscellaneous manufacturing plants, too varied in nature to warrant separate classifications, although many of them are just as important individually as some of those already mentioned. These include such lines as fish products, tanning and leather manufactures, rubber goods, glass, sugar, starch, strawboard and paper, briquettes, mattresses and many minor lines of endeavor.

Some of these are still more or less in the experimental stage of development in the state, or else have not been introduced at all; while others are side issues to some of the more important industries already in existence.

FISH PRODUCTS.

Salmon canning, as already stated, is by far the most important branch of the fishing industry in Washington, but the canning of oysters, clams and crabs also assumes considerable proportions. The total output of food fish and shell fish for 1913 was estimated by the state fish commissioner to be close to $20,000,000, while in 1916 it probably reached $13,000,000. Puget Sound, Grays Harbor and Willapa Bay are the principal localities for the business although some is carried on along the Columbia river.

While, as indicated by the reports received by this Bureau, there are undoubtedly openings along Puget Sound and on the Columbia river for new salmon canneries, the greatest need seems to be for plants which can utilize varieties of food fish not extensively used at present.

Among such fish are halibut and cod. The halibut banks and cod fisheries off the mouth of the Straits of Juan de Fuca and in Bering Sea yield heavily in these fish and it is claimed that the supply is unlimited. Much of it is brought to Washington plants to be cured and canned. At Poulsbo the largest cod packing plant of the Pacific Coast is located.

Recently the much despised dogfish, which exists in unlimited quantities, has undergone a change of name and as "gray fish" is being canned in large amounts. The octopus or devil fish is a luxury much esteemed by the Japanese. Thousands of these creatures can be caught in Puget Sound. Smelt by the millions run annually up the Columbia river and into the Cowlitz, and silver smelt and herring abound in Puget Sound; but the packing or preserving of these fish is far below their possibilities.

Among the Scandinavian population of the state there is a considerable demand for many fish products which were formerly imported in large quantities from Norway. It would seem that a near substitute for Norwegian fishballs could be produced from some of the fish of these waters. Certain varieties of fish found here can be salted or pickled, smoked or dried and there is still a wide field for development in this industry which is commended to the attention of men who have had experience in this line.

In this connection might also be mentioned the whaling industry which offers attractive openings. One company now operates an extensive plant at Bay City, on Grays Harbor, where all parts of the big sea mammals are utilized. Formerly, whales taken at sea were cut up and the oil extracted on the whaling vessels, so that much of the carcass was wasted; but at this factory, the body is towed to shore and worked up into various by-products. Whale meat, too, has been marketed in considerable quantities and promises to become a staple article of food in Pacific Coast states. In two days whaling during the month of August, one boat took six sperm whales valued at $15,000, and conveyed their catch to this factory.

TANNING AND LEATHER MANUFACTURE.

The manufacture of tannic acid from the bark of the western hemlock and the tanning and manufacture of leather are allied industries for which conditions are very favorable at many points in this state. As mentioned in another chapter (page 87), the western hemlock is rich in tannic acid of a high grade, which, according to the estimates of experts, can be cheaply extracted and, when combined with catechu or "cutch," a tan-

ning extract obtained from China, which is available here at a minimum cost, the very best results are obtained.

An exhaustive paper on "Western Hemlock" by Edward J. Hanzlik, Forest Examiner, and Howard B. Oakleaf, in charge of forest products, U. S. Forest Service, published October, 1914, says:

"Of the 2,200 tons of bark used annually in the Oregon and Washington tanneries, two-thirds are western hemlock. The tanning industry is still in its infancy in these states, and at this writing but few tanneries are in operation. The comparatively small amount of bark used now is but a fraction of the possible output. The industry, therefore, has tremendous possibilities and will undoubtedly become more important as soon as economic conditions adjust themselves to make more profitable the shipping of the extract or the installation of large local tanneries. * * * Although thinner than that of eastern hemlock, the bark of the western species is exceedingly rich in tannic acid. This has long been known to the trade, and several small tanneries now in operation in the Northwest use hemlock bark almost exclusively."

B. L. Grondal, Instructor in Forestry, University of Washington, is quoted as saying: "In the tanneries now operating in the Pacific Northwest, catechu or 'cutch,' tanning extract obtained from the Orient, is used to modify the tanning extract obtained from the western hemlock bark. In this way a very satisfactory and cheap extract can be prepared. Unmodified hemlock bark extract is, however, very satisfactory for many leathers."

At the present time, a large percentage of the lumber exported from western Washington is shipped to countries that are large producers of cattle and other animals whose hides supply the raw material of the tanneries. If a reciprocal trade could be established, the vessels carrying lumber to South America, Mexico, Australia, New Zealand, Africa and Siberia could bring back cargoes of hides at a minimum cost. Last year, more than two million dollars' worth of hides were imported from the Orient, but practically none from any of the other countries came through the Washington ports. In eastern Washington a large number of hides are produced locally and openings for

HANDLING THE "SILVER HORDE."

No. 1. The spillers of a salmon trap. No. 2. 10,000,000 cans of salmon. No. 3. The largest salmon cannery in the world, located at Bellingham.

tanneries are suggested by some of the larger cities in that section.

It seems that this line of business is capable of a wonderful development, both industrially and commercially, as all the necessary material could either be supplied locally or laid down here at a minimum cost. There would be a large local demand for the product as well as an export market in Alaska, British Columbia and trans-Pacific countries, while the surplus could be shipped to Rocky Mountain and Central states by any of the transcontinental railroads or to the Atlantic seaboard by rail, or by steamer through the Panama canal.

The local production of staple and fancy grades of leather would at once open the way for the establishment of large boot and shoe, glove and other leather-working factories for which climatic conditions, abundance of cheap power and excellent transportation facilities render this locality especially favorable.

RUBBER GOODS.

Some of the same conditions which affect the manufacture of leather apply with equal force to the manufacture of rubber goods and point to Washington as an ideal location for great factories to handle this material. Reports to the Department of Commerce for 1916 show that New York was the only customs district in the United States that exceeded Washington in the amount of raw rubber imported, more than twenty-two million dollars' worth having been received in Seattle last year and seven million in Tacoma, largely from the Straits Settlements.

There is no logical reason why much of this raw material should not be manufactured into many articles which are used locally, or exported in large quantities by way of the Pacific Coast ports. Many such articles could be manufactured here as well as on the Atlantic Coast and with a large resultant saving in cost of transportation. These would include especially rubber clothing and footwear for which there is an exceptionally large local demand, owing to the mild, moist winters which prevail near the Pacific Ocean. Then, too, recent manufacturing conditions have caused rubber composition to be used to a large extent in conjunction with, and to replace, leather in some parts of the boot and shoe manufacturing industry.

Another item is automobile tires, there being more than a hundred thousand autos in the State of Washington. Tires for all of these are shipped from eastern factories, involving an expenditure of from five to ten million dollars yearly.

The day should certainly be not far distant when the state will hold the same rank in the manufacture of rubber goods that it does now in the importation of the raw material.

GLASS.

The possibilities for glass manufacture in Washington have been thus far practically overlooked, the only factory in the Northwest being one located in Anacortes, which produces flint-white bottles, jars, etc., of the best commercial quality. Silica sand or glass quartz exists in large quantities in many localities and other factors necessary for glass production can be obtained. Bearing directly on this subject are the remarks of a representative of the Spokane Chamber of Commerce who reports an opening there for a glass factory to make flint glass:

"Silica sand, the chief material, is found here in abundance; freight rates from eastern glass centers are high and act as a tariff protection; cheap gas is a necessary factor, but with our cheapest coals and by the use of mechanical stokers, the problem can be solved; the labor question is important, but by importing a nucleus of skilled help, a good working organization could soon be built up. A large market exists in the Northwest and an export trade could be built up with Australia, New Zealand and China, where German or Austrian goods will probably never be sold again, while the freight rates from New York on American-made goods is prohibitive."

Reports have been made of silica sand and pure white quartz existing on the Olympic peninsula in the vicinity of Port Angeles. White quartz has also been quarried commercially on Orcas Island and used by the Anacortes plant. Silica of glass making quality is reported to exist in large quantities in the northeastern part of Yakima county and also in Kittitas and Benton counties. Grant county reports large quantities of silica and soda and a small amount of potash. Lead, arsenic and other minerals used in the manufacture of some forms of glass are also produced in this state.

SUGAR.

Yakima county is about to witness the first extensive, practical test of the possibilities of beet sugar production in the state. A large plant has been erected at Yakima by the Utah-Idaho Sugar Co. and a considerable acreage of sugar beets contracted for in the surrounding country. Laboratory tests indicate that a large portion of Eastern Washington's irrigated section is especially adapted for raising sugar beets and the

Sheep hides at tannery.

practical results of the present operations in the Yakima valley are being awaited by other communities where similar conditions as to soil and climate exist. Arrangements have been practically completed by the same company for the erection in 1918 of a plant at Toppenish.

The Yakima plant is of medium size, having a capacity of about 600 tons in twenty hours, but its equipment is of the best and most modern type. About 7,000 acres of valley land have been planted to beets and it is estimated that from 8 to 25 tons per acre can be produced. For their crop, the farmers receive

$7.00 per ton and the cost of production is estimated at about $45.00 per acre. In addition to this guaranteed price, the company offers to divide with them all net profit above $1.00 per sack. The beets planted are of an early variety and the sugar content runs about 16 or 17 per cent.

The success of this industry will mean much for the state, both industrially and agriculturally, as, next to hops, the sugar beet, according to government reports, has the highest average acre value of any farm crop ever grown in the Northwest, and nearly four times the average acre value of corn or wheat. According to the same authority, the sugar content of beets raised in the Pacific Coast states is higher than in those of any other part of the United States. So, although the industry calls for large capital and technical experience, it has every chance of success when undertaken in the ideal fields of the State of Washington.

POTATO STARCH.

The enormous potato crops in many sections of Washington (there being altogether about 60,000 acres, the average yield of which is 4 to 5 tons per acre) has caused numerous suggestions that starch factories could find profitable openings in a number of communities. The starch manufactured from potatoes is used for laundry purposes, for sizing paper and in textiles, also for other technical purposes as well as in some phases of cookery.

While temporary conditions have caused the market value of potatoes to be out of proportion, they are usually quite reasonable in price and could probably be depended upon to furnish abundant material for several such industries. Generally, the content of starch in Washington potatoes is high and they are well suited for this purpose. The only industrial use that has been made of them in this state has been by a few plants which dried or canned them on a small scale for the Alaska trade.

STRAWBOARD AND PAPER.

Several communities have suggested that openings exist in their vicinity for straw-board and paper factories which might

utilize the straw of the grain growing districts which is now almost entirely wasted. In much of the wheat country east of the mountains, large quantities of straw could be obtained very cheaply, practically all of the cost being that of hauling to the factory. In certain sections of the west side where oats are grown extensively, as in the LaConner flats or in Lewis county, there is an abundance of straw which could be used for this purpose. The present high price of paper and the cheapness of the raw material creates a prospect that seems to merit careful investigation by some manufacturer familiar with this business.

BRIQUETTES.

The large quantities of coal dust and fine coal now practically wasted in many of the mines which are operated in various sections of Washington, afford opportunities for briquetting plants which can utilize this material. By combining the fine coal with a combustible binder, briquettes are produced which form an excellent fuel. Experiments have also been made toward briquetting sawdust and it is probable that, as the cost of fuel advances, it will be possible to produce and market them at a profit.

MATTRESSES.

Mattress manufacturing is an industry which does not exist extensively in this state but which might be practical in a number of communities. For cheaper mattresses, excelsior could be produced from varieties of wood which abound in the forests, while cotton from the Orient reaches our ports in large quantities. Wool is extensively raised in eastern Washington and hair could also be procured from that section.

MANY MINOR LINES.

Various parts of the state offer excellent opportunities for other lines of lesser industries which would supply local demands. Among these might be mentioned cigar and tobacco manufacturies, confectionery and candy factories, flavoring extracts and syrup, ice and cold storage plants, foundries and

machine shops, concrete block plants, broom factories, button factories, soap manufacturing and other miscellaneous industries. At the present time, an infinite variety of articles which are used to a greater or less extent by the people of the Northwest are imported from eastern manufacturing centers, but as the local demand grows, it will be found more economical to manufacture such articles in this state.

Interior of paint factory.

CHAPTER XX.

ENCOURAGEMENTS OF A PUBLIC, SEMI-PUBLIC OR PRIVATE NATURE.

Manufacturing in this state holding out such splendid possibilities, the people are doing all that can be expected to encourage those who desire to take up any industrial branch and help develop our latent resources, or utilize raw materials that are at present allowed to go to waste. Although the experiences of many communities have inclined them to discontinue offering special concessions, too liberal franchises or large bonuses, and caused them to investigate, more carefully than hitherto, promotion plans which seem to depend for their success upon large blocks of stock being subscribed locally, yet there are no cities or towns in the state where a worthy enterprise will not find substantial aid and support.

LOCAL ASSISTANCE.

The replies to a questionnaire sent out from this office to the various communities of the state show that out of 275 places reporting openings for one or more industries, 90 made definite offers of special encouragements in the way of free sites, bonuses or other forms of assistance (see table, pages 206-216); while in a number of other instances it was stated that the commercial bodies would carefully consider individual cases and co-operate in every possible way. In several cities, suitable tracts of land have been set aside to be assigned on long time leases, without cost or at a nominal rental, to new industries backed by responsible people. A number of commercial clubs express a willingness to aid desirable enterprises and *bona fide* propositions in securing additional capital by local subscription, and committees of their business men stand ready to assist in this way. Valuable information regarding the supply of raw material, markets, transportation, etc., can also be obtained from such organizations by the manufacturer seeking a location for his industry.

Another substantial service which many local commercial bodies will render, applies to such industries requiring the development of certain resources in the community. For example,

the successful operation of a condensery depends upon the available supply of milk; a cannery must have a definite quantity of certain fruits and vegetables; while a beet sugar factory must be guaranteed a sufficient acreage of beets. The business men through their commercial organizations in communities which present favorable fields for such industries will assist actively in securing the co-operation of farmers and dairymen and other producers and in arranging for an adequate supply of all materials when a reasonable profit can be promised.

In many localities, manufacturers of special lines will be assured substantial co-operation from private individuals or companies operating allied industries. For instance, factories that can utilize waste or short length lumber will be given every reasonable assistance by many of the saw mills, and coal mine operators would co-operate with plants which could briquet the fine coal or extract chemical by-products.

FEDERAL AIDS.

The state and federal governments, through their various departments and commissions, also render valuable assistance to those in a position to take advantage of it.

Some of the principal encouragements by the federal government occur in connection with the administration of the national forests. They include the sale of timber, the issuance of stock grazing permits, the granting of mining privileges and opportunities for water-power development. Regarding such work, the district forester says:

"The government offers for sale, on application, tracts of 'stumpage' which is ripe for cutting, the timber to be cut under regulations which provide for the perpetuation of the forest and the growing a second crop. The price charged for stumpage in commercial sales of national forest timber is the appraised value of the timber, which varies with species, accessibility, quality, etc.

"Stock grazing privileges upon the national forests are permitted by the forest service and a graduated scale of fees is charged per season, based upon the yearlong rate of 75 to 80 cents per head of cattle, 94 cents to $1 per head for horses, 52½ cents per head for swine, and 18 to 20 cents per head for sheep.

"Embracing, as they do, the headwaters of practically all the important streams of the state, the national forests offer special opportunities for water power development. The title to these power sites is never transferred outright to individuals or corporations, but development and utilization privileges are granted. The annual charges for these privileges are based upon the net electrical horse power capacity of each project, and range from 10 cents per horse power for the first year, to $1 for the tenth year; continuing at the dollar rate each succeeding year for each net electrical horse power, for a term of not more than fifty years, with privilege of renewal at the expiration of the period covered by the permit.

"Through government and state co-operation and the rigid enforcement of protective laws, and a systematic and effective organization of forest patrol, the danger from fires has been materially reduced and all public interests within the national forests carefully conserved.

"Miners and prospectors have the same privileges upon the national forests as elsewhere upon the public domain. Mining claims may be located and the timber necessary for their development may be cut on the claims. Miners and prospectors may also obtain free permits to cut timber from national forest land outside the limits of their claims when needed for developing their prospects."

The federal government has been instrumental, through other departments, in providing much accurate information about the geological and meteorological conditions existing in this state. Surveys of soils, power sources and reports on mineral resources of the state, prepared by federal geologists in co-operation with the state department of geology, are available for the information of those interested; and the weather bureau stations in various localities have kept records of climatic conditions which would prove valuable to many lines of industries.

STATE AIDS.

One of the principal ways in which the state government encourages manufacturing is by the selling or leasing, under liberal terms, of its public lands, which include many miles of tide and shore lands well suited for manufacturing sites. Such lands may be purchased at public auction by the highest bidder, but at not less than the appraised valuation, which is usually comparatively low; and may be paid for either in cash or on terms

Big brick and lime factory near Spokane. **There are unlimited clay deposits of all kinds in Washington, and in almost every county. Limestone is common in many sections.**

of 10 per cent. cash, and the remainder in nine equal annual installments, with interest at 6 per cent. on deferred payments. Much leniency is shown by the state in the carrying out of such contract. Should temporary financial stringency overtake the purchaser and make it impossible for him to meet the exact requirements of the obligation, it is the policy of the land department to take no advantage of the situation, but to allow the purchaser every reasonable opportunity to show good faith in his efforts.

Under the constitution of Washington, "the use of the waters of the state for irrigation, mining and manufacturing purposes shall be deemed a public use." For the purpose of permitting power development or the storage of water for manufacturing, the state grants the right to overflow its lands adjoining lakes or streams; and permits for this can be secured directly from the State Board of Land Commissioners, subject to payment of damages incurred, without the necessity of purchasing the land, thus eliminating the uncertainty of securing it at public auction.

Under the provisions of the new Water Code, adopted in 1917, persons or corporations desiring to appropriate water from streams or store water for a beneficial purpose, may secure permits from the State Hydraulic Engineer after proper investigation. To safeguard every legitimate effort and stimulate the development of the water resources of the state, a temporary permit will be issued, which prevents interference and protects the applicant's priority. This will be continued under certain regulations until the issuance of the regular permit or until sufficient reason is found to reject the application.

The state will also sell timber from its lands and lease the right to mine all minerals, oil and gas, with the exception of coal. Complete information regarding state lands and the regulations governing them can be obtained from the Commissioner of Public Lands, Olympia.

Something of the magnitude of the wealth at the disposal of the state may be understood from the fact that the public domain placed under the control of the state land office contains 2,701,990 acres of uplands and more than 1,800 miles of tide

and shore lands. This area is equal to more than two and a fifth times the state of Delaware, while its length of water front exceeds the sailing distance from New York to Galveston.

INDUSTRIAL LEGISLATION.

Washington has been one of the foremost states in the adoption of legislation for the wise regulation of labor conditions and the protection of working men and women, but experience has shown that, in the enactment of these laws, the best interests of the employer have been considered and that their application has generally been beneficial to the growth and prosperity of existing industries. Among the measures of legislation which apply in some degree to manufacturing industries are the Industrial Insurance and First Aid acts, the Eight Hour Law for Women, the Minimum Wage Law, and laws regulating child labor; also those regulating public utilities through the Public Service Commission.

The Industrial Insurance law, which was originally passed in 1911 and has since undergone a few modifications, guarantees compensation to injured workmen or their dependents through a fund collected from the various classes of industries providing hazardous employment, this fund to be collected and administered by a commission of three men known as the Industrial Insurance Commission. The effect of this act is to abolish all civil action for personal injury by the employee against the employer, to remove any necessity for the intervention of casualty companies, and to relieve the individual employer from direct liability. This law is based on the theory that the cost of accidents occurring in any industry should become a part of the cost of the product, so that the expense may be borne by the ultimate consumer rather than that either the individual or the employer should bear the entire burden of the inevitable hazard of production. As a supplement to this law, the legislature of 1917 added a provision for "first aid" and medical attendance to be paid out of a fund to which both workmen and employers contribute, and to be similarly administered.

To protect women and the homes, a law was passed providing that no female should be employed in any mechanical or mer-

cantile establishment, laundry, hotel or restaurant in this state more than eight hours during any day except when employed in harvesting, packing or canning any variety of perishable fruit or vegetable, or canning fish or shell fish. This law also requires suitable seats to be provided for the use of women when not actively engaged in their duties.

The Minimum Wages for Women law, passed in 1913, recites that "the welfare of the state demands that women and minors be protected from conditions of labor which have a pernicious effect on their health and morals," and declares that inadequate wages and unsanitary conditions of labor exert such pernicious effect. It provided for the creation of the Industrial Welfare Commission to establish such standards of wages and conditions of labor for women and minors employed within the state as should be held to be reasonable and not detrimental to health and morals and which should be sufficient for the decent maintenance of women. The commission was established and the act put into effect with very beneficial results for employee and employer.

Since 1911, the power to regulate common carriers and public service corporations in this state has been vested in the Public Service Commission. This commission has supervision over railroads, steamboat lines, street and interurban railways, light and water companies, telephone and telegraph lines and public wharves and warehouses. It establishes and enforces uniform rates and service, and guards against discrimination or unfair methods of competition.

The manufacture and sale of intoxicating liquor has been prohibited in Washington since the beginning of 1916, thus eliminating some lines of industrial enterprise and opening additional fields for new ones. Since this law went into effect, a number of the breweries have been converted into plants for the manufacture of other products, particularly non-intoxicating drinks made from malt or fruit juices. The adoption of prohibition has also had a beneficial effect on social conditions, particularly among the industrial workers.

Other legislation and state supervision of interest to the manufacturer includes laws which provide for the proper safe-

guarding of machinery, sanitation in factories and workshops, a state inspection of weights and measures, and the inspection of many classes of material, such as agricultural, horticultural and dairy products, coal mine inspection, etc.

RESEARCH ASSISTANCE.

The University of Washington at Seattle, and the State College at Pullman also render important assistance to industrial plants. These institutions are well equipped with laboratories and special apparatus for making tests and exhaustive studies of materials and processes. Their services and facilities are always available to persons needing them.

In the University of Washington, "a special bureau of industrial research is maintained for the purpose of co-operating with the industries of the state in the study of industrial problems. Such problems may be referred to the University as industrial fellowships and through this bureau, the various departments of the University co-operate in the study of a given problem." In this way, "the industries of the state benefit through the research work done at the University and the special training given to men who become interested in the particular problems of any industry." For the year 1917-18 three fellowships have been established, one problem dealing with the iron and steel industry, another with a study of wood preservation while a third is making an industrial survey of Seattle and its environs. In this connection the reader is also referred to chapter XVII of this publication.

Among the departments of the University which are equipped to render special service along industrial lines are the botany and chemistry laboratories; the civil engineering laboratories, with special departments for experiment in hydraulics, structural materials, cement and road material testing; electrical engineering laboratories; forest laboratories, with special equipment for studies in timber physics, wood technology and utilization of forest products, including a general laboratory and special departments for research in wood preservation, wood distillation and kiln drying; mechanical engineering laboratories, in connection with which are thoroughly modern woodworking

National Corn Exposition

OMAHA, NEB. June [illegible], 1910.

Mr. W. C. Jarrett

Pullman, Washington.

Dear Sir:

We are pleased to be able to notify you that you won first on Prem. 207, Milling Oats. The premium is the Johnson Grain Binder, value $150, offered by Johnson Harvester Company, Batavia, N. Y.

Their jobber are Lininger Implement Co., Omaha, Neb., who I think will handle the matter in sending out the binder. Will you send the enclosed certificate of award to the Lininger Implement Company, with instructions as to shipping the premium.

Very sincerely yours,

J. F. Sturgess

Secretary.

THIRD ANNUAL EXPOSITION · DECEMBER [illegible] TO 18, 1909

Certificate and medal proving the high quality of Washington grain.

shops, machine shops, foundry and forge shop; pharmacy and materia medica laboratories for research in drug analysis and manufacturing pharmacy; and geology and mining and metallurgical laboratories. These latter in addition to their own very complete equipment are supplemented by that of the U. S. Bureau of Mines Experiment Station, which is conducted in connection with the College of Mines. This is more fully discussed in last part of chapter XVII, to which the reader is referred.

The State College, also, is equipped with a number of excellent laboratories, including a very complete one for testing materials, and special laboratories for agronomy, dairy products, animal husbandry, poultry and farm mechanics. It maintains as well a number of experiment stations at various points in the state where special work is done along lines of agriculture and horticulture and their branches, with special regard to peculiar local conditions.

The instructors and advanced students at these institutions are generous with their time, and spare no efforts to render every possible aid in the investigation of problems that confront the manufacturer.

LOCAL PRIDE.

The citizens of Washington are proud of their state and proud of the rapid development already made. They stand ready to lend loyal support and patronage to industrial institutions located in their midst. This feeling accounts for the existence of a number of organizations in different cities which have for their main purpose the cultivation of a kindly spirit toward all Washington-made goods. Each of the largest cities have manufacturers' associations which make a point of exhibiting and advertising such articles, while home consumers' leagues and other allied organizations are becoming more active in urging local use of all "Made in Washington" products.

So, with loyal support and general encouragement from the home people, an infant industry is given every chance of reaching maturity and extending its usefulness to the rest of the world.

CHAPTER XXI.

INDUSTRIAL CENTERS OF THE STATE.

While a large portion of the State of Washington is well adapted for general manufacturing and there are few sections where some special lines would not prosper, there are certain centers of population which, because of a combination of natural and artificial advantages, have already attained considerable importance and offer particular promise of further industrial growth. Although it is impossible, in the limited space afforded, to give more than a brief outline of their scope and development, this publication would be incomplete without some individual mention of these principal cities, both because of what they have become and promise, and because general conditions in each of them to a certain extent reflect the conditions in their immediate vicinity. These centers exercise a direct influence on agricultural and industrial conditions throughout all the territory tributary to them, and their accumulated development largely constitutes the development of the state.

The State of Washington contains one city of more than 300,000 population, two others of more than 100,000 population, two of about 35,000, two of more than 20,000, and four of 10,000 or over, all of which have achieved more or less importance as manufacturing centers. There are also a number of smaller cities which, by reason of location or some particular advantage, have become trade centers for a considerable territory and which have already made extensive industrial progress or offer exceptional opportunities for some line of manufacturing.

With few exceptions the cities of Washington are of modern construction. They are equipped with ample water supply (usually municipally owned), electric lights and power, gas connection and sewers. Careful attention is given to sanitary conditions, and the larger cities have spent much money in beautifying by means of spacious parks, scenic drives and broad boule-

vards. A high school education is assured in every town. Telephone, telegraph and express service are almost universal.

The paragraphs below are devoted to the brief description of a few of these cities, and the others are mentioned in the second table which follows, containing tabulated information relating to all communities requesting additional plants and concerning which it was possible to secure authentic data. Nearly all maintain local commercial organizations from which additional information can be obtained.

SEATTLE, estimated population 366,445, is the county seat of King County and the metropolis of the state. It is located on Elliott Bay, an indentation of Puget Sound, and occupies the hills and valleys lying between the salt water and Lake Washington. The city covers 60,460.8 acres and the distance from its northern to southern boundaries is about twelve miles. Green Lake and Lake Union lie entirely within the city limits. A ship canal recently completed by the United States government connects Lake Washington through Lake Union with the Sound. This canal cost $3,625,000 and its locks are the largest in this country excepting those of the Panama Canal. It gives ocean vessels access to a vast fresh water harbor and adds more than a hundred miles of shore line to an already extensive deep-water frontage. Because this additional waterfront is not subject to tidal conditions, it will be especially valuable as sites for industrial plants.

At present, the city's wharves and docks number 29, with a lineal frontage of 13 miles; their combined landside and shipside spur track capacity is 1,600 cars; wharf space, 3,500,000 square feet; and merchandise storage capacity, 900,000 tons. A hundred vessels can be simultaneously accommodated. There are also six drydocks with a combined lifting capacity of 50,000 tons.

Three systems of electric railway with a total mileage of 252.53 miles operate within the city, and interurban electrics connect with Tacoma, Everett, and Renton. Seven transcontinental and one intrastate railway enter. Service is given by 14 foreign, 15 coastwise, 19 local, and 4 city steamship companies. It has 264 miles of paved streets, 1,730 miles of graded streets, and 836 miles of concrete walks.

In 1914 there were 1,014 factories, the value of manufactures being about $65,000,000. The most important of these, commercially, included 55 lumber and timber products plants, 24 furniture factories, 82 foundries and machine shops, 214 printing and publishing houses, 5 brick and tile yards, 3 slaughtering and meat packing plants, 10 flour mills and grist mills, 10 canning and preserving plants, 4 butter factories, 15 other food factories, 45 copper, tin and sheet iron works, 5 malted liquor establishments, 5 men's clothing factories, 34 confectioneries, and 10 leather goods factories. Extensive developments of the past year would raise these figures ma-

terially. Among the newest developments is the steel and wooden shipbuilding industry which employed 2,000 men in September, 1916, and 12,000 men September 1, 1917. Four months later, there were nearly twenty thousand men employed. Some of the largest lumber and fishing industries of the state are centered here and the most important coal fields of the state are tributary. Both water and electric power, municipally owned, are available at low rates.

In 1916, its assessed valuation was $213,273,327; postoffice receipts, $1,563,397.83; and bank clearings, $790,217,950.01. It boasts the highest building west of New York. It has six high schools and sixty-nine graded schools, and is the seat of the University of Washington. Several business colleges and private schools are also located here.

Opportunities for the establishment of almost any kind of new industry exist. The Industrial Bureau of the Chamber of Commerce has arranged for the utilization of certain factory sites owned by the county at a very moderate figure and with no taxes on the land, by industries whose chances for success are favorable. Free sites may be obtained in some cases from private firms and other organizations having large holdings on Lake Washington or on Puget Sound, a short distance outside the city limits.

SPOKANE, Washington's second city in size (estimated population, 130,000), is the county seat of Spokane County and the financial, commercial and industrial center of the district known as the "Inland Empire." This tributary territory, which includes much of Eastern Oregon and Washington, Northern Idaho, Western Montana and Southeastern British Columbia, has remarkable resources in agriculture, mining and timber, and abundant water power; its estimated annual production of new wealth is $350,000,000.

The city itself occupies 25,120 acres lying on either side of the Spokane River, the wonderful falls of which are in the heart of the business district and furnish the power for many of its industries. Four power plants supply 172,000 horsepower. The river descends 1,280 feet in a distance of 100 miles, making possible a development of 400,000 horsepower, while the estimated potential power of the entire Inland Empire is 3,000,000 horsepower.

Spokane is a great railway center. Seven transcontinental lines enter, besides a number of local and branch lines. It has 150 miles of street railway and is connected by 213 miles of electrics with the principal surrounding cities. It has 72 miles of paved streets, 393 miles of graded streets and 634 miles of concrete sidewalks. The concrete approaches by which some of its railroads reach the central station are feats of modern engineering.

The most important raw materials available are minerals, cereals, timber, fruits, livestock, pulp-wood, clay, cement-rock and wool. The adjacent mining region is estimated to produce one-third of the entire lead output of the world; while mines, the activities of which center in Spokane, paid $12,000,000 in dividends in 1916. One-ninth of the entire wheat crop of the United States is

Nisqually power plant reservoir at La Grande, from which Tacoma derives power and light.

produced by this tributary section, which also has a national reputation for its fruits.

Such favorable conditions have caused Spokane to make great progress as a manufacturing city. The value of its manufactures in 1914 was close to $17,000,000. Included among its industries were 20 relating to lumber and timber, 23 foundry and machine shops, 56 printing and publishing plants, 22 bakeries, 3 flour mills and grist mills, 16 copper, tin and sheet iron plants, a large paper mill, cement plant, packing establishment and brick yard. Recent development has been proportionate to other sections. Estimates by the Chamber of Commerce place the value of manufactures for 1916 at $25,000,000.

Additional statistics include: Building permits (1916), $1,576,737; total assessed valuation, $80,217,218; actual valuation, $160,434,686; banks, 14; clearings (1916), $255,205,283; post-office receipts, $344,686; public schools, 37, with 20,018 pupils enrolled; wholesale business, yearly value, $30,000,000.

Special openings are reported by the industrial bureau of the Chamber of Commerce for a shoe factory, flint glass works, pottery factory, for pottery and insulators, and trunk factory. Opportunities also exist for many other miscellaneous lines of endeavor.

TACOMA, estimated population 120,000, is the county seat of Pierce County and the second city in size in Western Washington. It occupies a commanding eminence overlooking Commencement Bay on Puget Sound. Its total area comprises 25,168 acres of land and 2,752 acres of water. The distance from its northern to its southern boundary is about seven miles. It possesses extensive tide flats where space for innumerable factories and shops are available. Altogether at least 1,500 acres are suitable for such purposes.

At present the city's wharves and docks number 35, with a lineal frontage of approximately two miles. Their combined land-side spur track capacity is 700 cars; wharf space approximately 950,000 sq. ft. and merchandise storage capacity 170,000 tons. Fifty vessels can be simultaneously accommodated. There is also one drydock with a lifting capacity of 12,000 tons.

Tacoma has a total of 147 miles of electric railway and is connected with Seattle, Puyallup and American Lake by suburban electrics. Its railway service is about the same as Seattle's. In addition, service is rendered by six foreign, four coastwise and eight local steamship companies. It has 123 miles of paved streets, 319 miles graded and 400 miles of cement sidewalks.

In 1914 there were 339 factories and the value of manufactured products was $12,600,000. These plants included 26 lumber and timber product factories, 10 furniture factories, 27 foundries and machine shops, 18 copper, tin and sheet iron works, 15 cigar factories, 36 bakeries, 7 flour and grist mills, 58 printing and publishing establishments, besides many other miscellaneous industries. The extensive developments of the past year or two would increase these figures materially. This, too, is an important shipbuilding

point and many large steel and wooden ships have been recently contracted for. On September 1, 1916, there were less than 100 men employed in Tacoma's shipyards. At a corresponding date in 1917 approximately 3,500 men were working in them and by January 1, 1918, the number had reached 4,000 and more were being added each day. Large lumber and fishing industries are centered here and important coal fields are tributary. Of extreme importance is the big smelter, the second largest in the United States, which employs 1,100 men and has an annual output of $40,000,000. Water and electric power, municipally owned, are available at low rates.

In 1916 its assessed valuation was $54,629,845; postoffice receipts were $295,985.48; bank clearings, $790,217,950.01; and building permits, $1,617,981.00. It has a Greek stadium seating 30,000 people, which probably has no duplicate in the world. Its 32 school buildings, which include 3 high schools, contain 13,440 pupils, giving employment to 430 teachers. Several private schools are also located here.

Opportunities for additional industries in nearly all lines are numerous. For local markets nearly all Southwestern Washington is tributary. Of special importance is the United States army post at Camp Lewis, 17 miles south, where nearly 50,000 men are now in training and where at least one army division (18,000 men) will be garrisoned in times of peace.

EVERETT, estimated population 36,000, is the county seat of Snohomish County and the principal trading point for Snohomish and Island counties and adjacent territory. Its area is 6,400 acres. Situated on the peninsula between the mouth of the Snohomish River and Puget Sound, it has the advantages of 22 miles of deep water frontage; the largest ocean steamers can reach its docks. It is the port of call for steamers of the regular Pacific Coast and Alaska lines. Five regular steamers connect with Seattle and one runs daily to Bellingham. Four transcontinental railroads and two electrics to Seattle, Snohomish and Monroe, furnish rail transportation. It also has 17½ miles of local street railway, 7 miles of paved streets, 40 miles graded, and 101.7 miles of concrete walk.

The city's assessed valuation is $13,894,893; postoffice receipts (1916), $79,200; public schools, 13, with 174 teachers and 5,316 pupils. A separate vocational school and several private schools are maintained.

The principal raw materials are timber, fish, clay and cement materials; also dairy and other agricultural products. Manufacturing statistics according to the 1914 census show 98 industrial plants, capitalized at $6,297,833, employing 2,112 men, and turning out products valued at $6,530,405. Recent estimates by the Commercial Club place the yearly production at $15,000,000 and the number of men employed at 4,496. Thirty-one of these plants utilize timber products and range from large sawmills, cutting 750,000 feet of lumber per day, to box factories and cabinet works. Included in these are ten straight shingle mills, six straight lumber and seven

combination lumber and shingle mills; also a large pulp and paper mill, five iron works, three fish canneries, a flour mill, and tannery.

Openings are reported for a furniture factory and for shipyards.

BELLINGHAM, with an area of 10,000 acres and an estimated population of 35,000, is the county seat of Whatcom County and the metropolis and chief trading center for Whatcom, Skagit and San Juan counties. Its harbor, Bellingham Bay, can accommodate steamers drawing 26 feet of water. Regular steamers run to Seattle and way points; also out among the islands. It is served by three transcontinental railroads, 33 miles of interurban electrics and 25.5 miles of street railway. Paved streets total 40.7 miles and concrete walks 93.6 miles.

Further statistics show, assessed valuation, $10,742,396; actual valuation, $32,000,000; 4 banks, clearings (1916), $30,000,000;

Glass factory at Anacortes. The only one in the Northwest.

postoffice receipts (1916), $74,154.73; 13 public schools, 5,207 pupils; state normal school, enrollment, 200.

Its greatest activities are directed towards timber products and fisheries, but the surrounding country is also important for dairying and other agricultural pursuits. Some mining is also carried on. In 1914, according to the United States census, there were 86 plants with an output for the year of $6,264,000. A rapid increase, however, is now taking place. Among the most important establishments today are 11 lumber and shingle mills, employing about 1,700 men, representing a capitalization of $3,500,000, two shipyards, eight fish canneries, including the largest salmon cannery in the world, nine woodworking industries, three creameries, three iron works, one of the most modern cement plants in the United States. brick yards, flour mill and a number of miscellaneous plants.

Openings are reported for paper mills, tile, brick and pottery factories, furniture factory and a broom and broom-handle factory. Three hundred acres of land suitable for factory sites are available.

PORT ANGELES, population 5,000, is the county seat of Clallam County and the most westerly city on Washington's great inland

sea. It is the commercial and industrial center of the northwestern part of the Olympic Peninsula, a territory possessing enormous resources of timber and fishing, with indications of abundant minerals and promise of greatly increased agricultural production. Four steamboats make daily calls. Rail connection with Port Townsend is supplied by a branch of the Milwaukee, which connects at Port Townsend with special steamers to Seattle. Power is provided by the Olympic Power Company's hydro-electric plant on the Elwah River, which also serves Port Townsend, Bremerton and the Puget Sound Navy Yard, and is capable of very large development.

It has at present six shingle mills, three sawmills, box factory, cement block and tile factory, furniture factory, brick yard, salmon cannery and two octopus fishing plants. Opportunities are reported for a paper and pulp mill, flour and feed mill, oatmeal factory, shingle mill, lumber mill, veneer mill, barrel and tub factory, broom and tool factory, furniture factory, fertilizer and potash plant utilizing kelp, tannery and tannic acid factory, brick and tile factory, and glass works. Special inducements in the way of suitable sites are offered.

PORT TOWNSEND, population 5,000, is the county seat of Jefferson County and commercial center for the northeastern section of the Olympic Peninsula. It is a port of entry and a station for United States immigration, quarantine and revenue cutter service. It also has a United States custom house and is close to three federal forts, Casey, Flagler and Worden, which guard the entrance to Puget Sound. A recently completed canal gives an inside passage from its excellent harbor to the main Sound, which enables small craft to avoid the heavy seas of the Straits and shortens the distance to up-Sound points. It is served by several steamers and has rail connection with Quilcene and Port Angeles.

The resources of the tributary territory include timber, fish, dairy and agricultural products, also abundant mineral deposits. Its principal industries consist of two salmon canneries, fertilizer plant, sawmill, woodworking plants and boat shops. Openings are reported for sawmills, shingle mills and shipyards.

ANACORTES, estimated population 5,000, is located on deep water at the western extremity of Skagit County, of which it is the metropolis. It has extensive wharfage and is served by both ocean vessels and Sound steamers. Rail service is rendered by the Great Northern. It has 2½ miles of paved streets, 25 miles of graded streets and 16 miles of concrete walks; 6 public schools, 36 teachers and 1,070 pupils. Its assessed valuation is $1,262,000.

Present industries include 7 shingle mills, 8 salmon canneries, 4 codfish plants, 2 mild cure plants, 3 lumber mills and box factories, 2 glue, fish oil and fertilizer plants, 1 glass factory, 2 creamery and cold storage plants, and a large shipbuilding plant. Factory sites are plentiful. Openings are reported for furniture factory, strawboard factory, cereal mill, shipbuilding plant with ways for purse seine boats, and foundry and machine shop.

SKAGIT VALLEY CITIES: The industrial and commercial activities of this valley largely center in a number of small cities, the largest of which are Mount Vernon, Sedro Woolley and Burlington, linked together by interurban electrics running out of Bellingham. The resources are chiefly timber and agricultural, this being one of the rich farming districts of the state. Mineral resources, including coal and limestone and iron, are found in adjacent mountains.

Mount Vernon, population 3,500, is the county seat and one of the most important dairy centers of the state. It is located on the Skagit River, which is navigable to this point, and the main line of the Great Northern. Two large condenseries and a creamery are located here; also several lumber mills, woodworking plants and a machine shop. Opportunity for a cannery is reported.

Sedro Woolley, population 3,000, is eight miles northeast of Mount Vernon on the Great Northern and Northern Pacific railroads. This city has developed rapidly as a manufacturing center, and has several saw and shingle mills, a large foundry and machine shop. veneer and excelsior plant, ice and cold storage plant, bottling works. creamery and condensery. Additional industries will find good opportunities and local encouragement.

SNOHOMISH, population 5,300, is located on the Great Northern, Northern Pacific and Chicago, Milwaukee & St. Paul railways; 10 miles southeast of Everett. The navigable Snohomish river runs through the city and provides considerable manufacturing area with deep-water advantages. An electric road connects with Everett and Seattle. It has several shingle, saw and planing mills; condensery and creamery, cannery, iron works and brick-yard. Openings are reported for a paper mill, ship yard and rubber goods factory.

BREMERTON, estimated population 6,000, is the metropolis of Kitsap County. It is situated on Port Orchard Bay, an arm of Puget Sound, 16 miles west of Seattle, with which city it is connected by hourly steamers. Its principal industry is the Puget Sound Navy Yard, where the federal government constructs and repairs naval vessels. More than 2,000 mechanics and laborers are employed during normal times by this plant, which represents an investment in excess of $12,000,000. The city is growing rapidly as the result of increased federal activity.

Its excellent harbor and proximity to Seattle are important advantages for general industries. Opportunities exist for the establishment of private shipbuilding yards and other industries which would require skilled labor of a class used in the yard and which could cooperate with the government in providing these men with continuous employment.

RENTON, estimated population 5,000, is located near the southern end of Lake Washington, four miles from the southern limits of Seattle, with which city it is connected by two electrics. Service is rendered by the Northern Pacific, Chicago, Milwaukee & St. Paul

and Columbia & Puget Sound railroads. The recent opening of the Lake Washington canal is expected to result in much development around this city, for considerable lake waterfront, well suited for manufacturing sites, is adjacent. Extensive coal mines are near and the largest units of the Denny-Renton Clay and Coal Company are located here. Other industries include a car manufacturing plant, briquetting plant and a macaroni factory. Openings are reported for a furniture factory, paper mill, creamery and cannery.

PUYALLUP, population 6,000, is the second city in size in Pierce County and the commercial center of the Puyallup Valley,

Manufacturing orchard spray at Wenatchee.

a district famous for fruit and berry growing. Being but nine miles from Tacoma, many of the same general conditions prevail. It is served by the Northern Pacific and Chicago, Milwaukee & St. Paul railroads and an electric road to Tacoma, and makes connection with the Seattle-Tacoma electric railway.

The principal industries relate to the preserving and canning of the fruits, berries and vegetables grown in the surrounding country. The production and marketing of these crops has been highly systematized through the medium of a local fruit growers' association. Several box factories and sawmills, a shingle mill and creamery are located here. Openings are reported for a cigar factory and bottling works.

OLYMPIA, population 12,000, is the state capital, county seat of Thurston County and the center of a large agricultural and tim-

ber area. Commercial building stone, coal and other minerals are adjacent. Located on a deep water harbor at the extreme southern end of Puget Sound, it is served by several lines of steamers. Rail transportation is provided by the Northern Pacific and Oregon-Washington Railroad & Navigation Company. Hourly stages run to Tacoma and several to Shelton, Tenino and Grays Harbor. It has also six miles of electric railroad which extends to Tumwater, the oldest town on Puget Sound. One of the largest of the sixteen United States cantonments is located 17 miles northeast.

Within the past year Olympia has become one of the important wooden shipbuilding points of the state, having two large yards, one with three and the other with eight ways, actively engaged in constructing great ocean-going cargo vessels. It is the largest shipping point in the state for oysters, both native and transplanted. Other industries in operation are three lumber and two shingle mills, sash and door factory, feed mill, fruit cannery, two iron works, knitting mill, two creameries, and an extract factory.

Openings are reported for a brick yard, broom factory, cooperage plant, cheese factory, flour mill, furniture factory, paper mill and pottery plant. Manufacturing area is extensive.

ABERDEEN AND HOQUIAM: The commercial, financial and industrial activities of the Grays Harbor country center in the cities of Aberdeen and Hoquiam, which occupy closely adjoining locations on the deep water harbor at the mouth of the Chehalis River. The district largely tributary to these cities embraces the southern part of the Olympic Peninsula and the lower Chehalis Valley. The chief resources of this territory are timber, including large bodies of spruce suited for aeroplanes, fish, crabs, clams and whales, and agricultural and dairy products. It is one of the most important lumber manufacturing sections of the state. Ocean vessels ply between these ports and every land, while packet steamer lines connect them with California ports. Railway service is supplied by three transcontinental systems, The Northern Pacific, Chicago, Milwaukee & St. Paul, and Oregon-Washington Railroad & Navigation Company. An interurban electric connects the two cities.

Aberdeen, population 18,000, has an area of 6,720 acres; assessed valuation, $7,415,979; actual valuation, $14,831,598; 26.62 miles of paved streets; 24.4 miles of graded streets; 27.1 miles of concrete walks; 11 public schools, 73 teachers, 2,110 pupils. Postoffice receipts in 1916 were $37,702.70. Besides numerous smaller plants there are twenty-three factories located here, which, according to a present estimate by the Chamber of Commerce, are valued at $15,000,000 and produce $14,000,000 in manufactures annually. They include 3 big shipyards, 1 spar yard, 13 timber and shingle mills, 1 wood tub and bucket plant, and 4 salmon and clam canneries. Three hundred and thirty acres of land of patent value for manufacturing sites is available. An excellent opening is reported for a pulp and paper mill.

Hoquiam, population 13,000, has an assessed valuation of $3,873,415 and an actual valuation of $7,746,830; 6 miles of paved streets, 21 miles of graveled or planked streets, 9 miles of concrete walks; 6 public schools with 50 teachers and 1,800 pupils. Postoffice receipts in 1916 were $25,490. Its Chamber of Commerce reports 40 manufacturing plants, all told, with lumber exports alone for 1916 of over $11,000,000. Nine sawmills, 6 shingle mills, 2 large shipyards and 2 fish canneries are among the most important establishments. Factory sites are plentiful and may be secured free or at moderate cost. Openings are reported for cooperage and other lumber products plants, shipbuilding, woolen mills and iron and steel plants.

SOUTH BEND AND RAYMOND: These two neighboring cities, located on Willapa Harbor and connected by a local trolley line, are the commercial and industrial centers for Pacific County in the southeastern corner of the state. Resources, transportation facilities, and future possibilities are similar. A heavy timber growth, fertile lands, and extensive salmon and shell fisheries supply abundant raw materials; while numerous streams on the slopes of the coast range create vast potential water power. Big ocean-going vessels load at these ports and coasting vessels ply between them and California. Local steamers connect at Nahcotta with Oregon-Washington Railroad & Navigation Company trains for Ilwaco and Astoria, Oregon. The Northern Pacific connecting at Chehalis renders rail service for both cities. The Chicago, Milwaukee & St. Paul reaches Raymond. Extensive deep-water manufacturing sites are available in both cities.

South Bend, population 3,000, is the county seat. Its assessed valuation is $1,385,903.00. Bank clearings in 1916 were $8,000,000 and postoffice receipts, $9,022.00. Its industries include several sawmills and shingle mills, fish canneries, three oyster plants, furniture and cabinet works, and box factory. Openings are reported for shipyards and wooden toy factory.

Raymond, population 5,000, was built up almost entirely from the lumber industry. Its assessed valuation is $1,774,864; bank clearings (1916) $7,950; and postoffice receipts (1917) $13,472.26. Ten big cargo ships are at present being constructed. Other sustaining industries include 7 saw mills, 5 shingle mills, 2 veneer plants and 2 box factories. Openings exist for additional ship yards, two excellent sites being available.

CENTRALIA AND CHEHALIS: The central inland portion of Southwestern Washington, a region of fertile valley, with a wealth of coal, timber and agricultural products, has for its principal centers of population the cities of Centralia and Chehalis, about four miles apart and connected by electric railway and four transcontinental lines besides two Willapa Harbor branches. Connections are made at Centralia for Grays Harbor points. Lewis County, in which these cities are located, has a larger area of agricultural land

than any other county in Western Washington. Both cities have electric power from a transmission system passing through them, and cheap fuel is supplied by coal mines in the immediate vicinity. Each has ample area for sites which can be secured on attractive terms.

Centralia, population 11,000, has an area of 2,300 acres, an assessed valuation of $2,442,910; 5¼ miles of paved streets, 30 miles of graded streets, 54 miles of concrete walks, 5 public schools, 39 teachers, 1,500 pupils. Postoffice receipts in 1916 were $22,537. Thirty manufacturing plants are reported, including 7 lumber concerns, porch column factory, sash and door factory, machine foundry, 2 creameries, furniture factory, cross-arms factory and glove factory. Openings are reported for fruit and vegetable cannery;

A machinery and harvester plant at Walla Walla.

combination vinegar, pickle and kraut factory; sash and door factory; brick and tile factory; broom handle factory and box factory.

Chehalis, population 5,000, is the county seat of Lewis County. It has paved streets, cement walks, high and two grade schools, with about 1,000 pupils. Assessed valuation in 1917 was $1,592,057; postoffice receipts (1916) were $19,019.15. Its industries include a large furniture factory, a large milk condensery, several creameries, two sawmills, planing mill, shingle mill, vegetable and fruit cannery, a mattress factory and sugar factory. Openings are reported for additional sawmills, brick and tile factories, fir door factory, and potato starch factory.

VANCOUVER, population 10,000, is the county seat of Clarke County and the oldest town in the state. It has an area of nearly 7 square miles, 10 miles of paved and 30 miles of graded streets, and more than 100 miles of concrete walks; 7 public schools with

53 teachers and 1,700 pupils. Its assessed valuation is $4,486,990 and postoffice receipts (1916) $24,000.

Located on the Columbia River, it enjoys the advantages of a deep water harbor. All the north and south railroad lines between Portland and Puget Sound points, also the Spokane, Portland & Seattle, pass through. A $1,600,000 interstate bridge, recently completed, spans the Columbia at this point and brings Vancouver in close connection with Portland, twelve miles away. It is served by street railways which extend to Portland, also to several rural communities. An army garrison of many men is located here.

The principal resources of the surrounding territory are timber and agricultural products. It has saw and planing mills, two shipbuilding plants, box factory, sash and door factory, two prune packing plants, flour mill, and numerous small industries. Openings are reported for furniture factory, shoe factory and additional shipyards.

WENATCHEE, population 6,000, county seat of Chelan County, is the center of one of the state's most famous fruit districts. It is located at the confluence of the Wenatchee and Columbia rivers, on the Great Northern railroad and is a junction point for branch roads to Oroville and Mansfield. It is the largest city on this system between Spokane and tide water and is the trading point and commercial center for North Central Washington, which includes Chelan, Okanogan, Douglas and part of Grant County. Large quantities of fruit and wheat are shipped. Its assessed valuation is $2,666,680 and postoffice receipts for 1916, $35,051.00. It has 1.5 miles of paved and 13.5 miles of graded streets; a high and four graded schools housing 1,244 pupils.

Its principal industries include two canning and evaporating plants, two meat packing houses, brick yard, dairy plant, flour mill and woodworking mill. Openings are reported for a cider, vinegar or other fruit by-products plant, and a large cannery or evaporator. An additional flour mill and custom machine shop are also requested.

ELLENSBURG, population 6,000, is the county seat of Kittitas County and the commercial center of the Kittitas Valley; the first important agricultural area reached after crossing the Cascades from the population centers of Puget Sound. The main lines of the Northern Pacific and Milwaukee roads provide rail transportation. Light and power are furnished by a municipal hydro-electric plant. The area of the city is 760 acres and its assessed valuation $2,787,064. There are 3.29 miles of paved and 6.81 miles of graded streets, and 16 miles of concrete walks. It has 4 public schools with 847 pupils. One of the state normal schools is located here.

The extensive dairying, sheep raising and diversified farming of the tributary country furnishes abundant material for various lines of industry. Two flour mills, three creameries, two sawmills and a glove factory are among its present plants. Opportunities are

reported for a milk condensery, cheese factory and beet sugar factory.

YAKIMA (formerly North Yakima), population 20,000, is the third city in size in Eastern Washington, the county seat of Yakima County, and metropolis of the valley of the same name, which contains the most extensive irrigated section in the state. The United States Reclamation Service is spending large sums of money in this valley. The resources are, naturally, chiefly agricultural. It is one of the most important fruit centers, but diversified farming has also reached vast proportions. Agricultural shipments of the valley were valued at over $14,000,000 in 1916 and over $27,000,000 in 1917. It is on the main line of the Northern Pacific railroad, which has several branches radiating from here to neighboring towns, and is served also by the Oregon-Washington Railroad & Navigation Company and by electrics which extend to several outlying districts. Streets are paved. It has a high school, eight graded schools, three

Anacortes manufacturing section.

parochial schools and two colleges. The state fair is held here annually.

Power and light are derived from a plant on the Natches River where 10,400 horsepower have been developed. Present industries include a lumber mill, sash and door factory, box factory, two woodworking plants, beet sugar refinery, cannery, vinegar works, cereal mill, five cold storage plants, cheese factory, three creameries, two foundries, two cement product plants, broom factory, two artificial ice plants and numerous fruit packing houses. Openings are reported for a condensery, evaporator, starch factory, broom factory, alfalfa mill and flour mill.

PASCO AND KENNEWICK: A vantage point in Eastern Washington is found at the head of deep water navigation on the Columbia near its confluence with the Snake River. Several trunk rail-

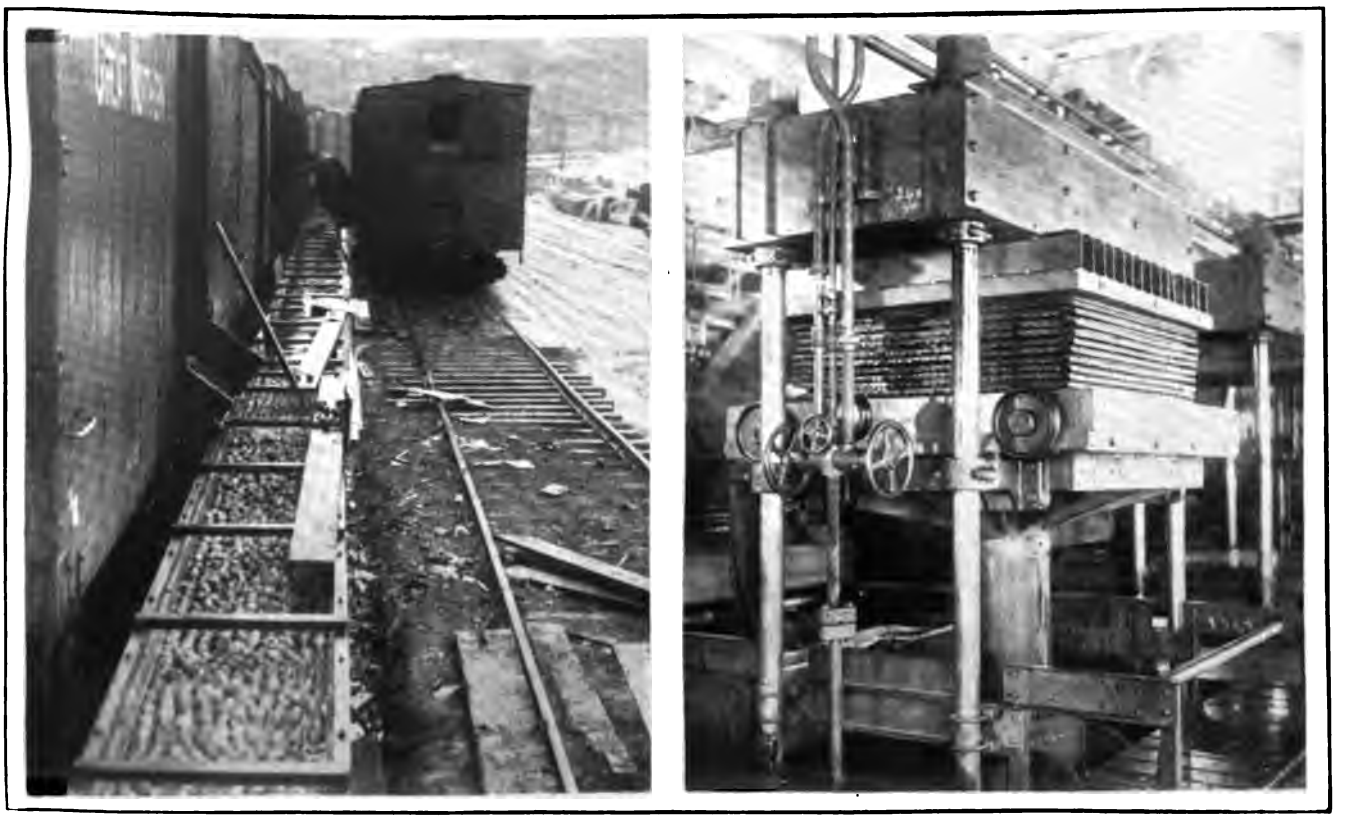
ways converge here and the opening of the Celilo Canal has brought direct boat service to Portland and Pacific Ocean ports. These advantages are shared by two cities, Pasco, county seat of Franklin County, on the east bank, and Kennewick, the largest city in Benton County, on the west bank of the great river. A rich agricultural region includes adjacent irrigated lands and more distant wheat sections. A few miles above is Priest Rapids, capable of generating a half million horsepower.

Pasco, with an estimated population of 3,500, is the division point for the Northern Pacific and Spokane, Portland & Seattle railroads. Besides a 37-stall roundhouse, its industries include sheet metal and iron works, machine shop, woodworking factory, bottling works and cigar factory. A stockyard was recently established. Openings are reported for a woolen mill and wool-scouring plant.

Kennewick, estimated population 2,500, is served by the Northern Pacific, Spokane, Portland & Seattle and Oregon-Washington railroads. Since the opening of the Celilo Canal, a port district has been formed and a large dock constructed. The city has a flour mill, box factory, broom factory, cold storage and bottling works, grape juice factory, sheet metal works and a planing mill. An opening for a cannery is reported.

WALLA WALLA, population 24,000, is the county seat of Walla Walla County, the second city in size in Eastern Washington, the commercial center of Southeastern Washington and a trading point for much of Northeastern Oregon. It is surrounded by one of the richest agricultural sections in the state. The main raw materials are grain, fruits, and livestock products. Cattle and sheep raising and dairying are important. Walla Walla County, and valley extending across the state line, produces annually from 500 to 1,000 cars of apples, about 4,000 tons of prunes, 400 tons of cherries, 200,000 sacks of onions, and 500 tons of asparagus. Wheat production is about 5,000,000 bushels and barley 600,000 bushels annually. Rail transportation is provided by the Northern Pacific and the Oregon-Washington Railroad & Navigation Company. An electric line serves the city and extends to Milton, Oregon. Streets are paved. It has a high school and five grade schools, and is the seat of Whitman College. The state penitentiary is also located here.

Industries include alfalfa, cereal, feed and flour mills; four implement factories, tile factory, meat packing house, cheese factory, creameries and fruit drying plants, three sash and door factories, and many miscellaneous ones. In 1914, forty-seven establishments produced manufacturies valued at $2,014,673. Openings are reported for fruit and vegetable cannery, milk condensery, saw factory, straw broom factory and beet sugar factory.



A fruit by-product plant at Olympia, showing the flume, and the press with 2,500 pounds pressure per square inch.

EXPLANATION OF TABLES SHOWING ENTERPRISES NEEDED.

The following tabulations represent actual requests from the different communities of the state for the installation of additional manufacturing plants in their vicinities. Together they constitute the main reasons for the publication of this book on "Manufacturing Opportunities in the State of Washington," the foregoing chapters being rather introductory and for the main purpose of throwing light on the extensive and diversified demands which these tables present.

COLLECTING MATERIAL.

In collecting the material contained in these tables and in some of the preceding chapters, questionnaires were sent to public and semi-public officials, business men and other representative citizens in every city and town in the state. Manufacturers in the different lines were also interviewed personally or questioned by letter regarding conditions which applied especially to their industries, and wholesale and retail dealers distributing these products were invited to make suggestions. In addition, a representative of the Bureau made a personal visit to many of the places mentioned.

PROPER USE OF TABLES.

These tables are of necessity neither complete nor conclusive. Their proper use is as a guide to anyone desiring to devote his capital or energy to the installation and management of some manufacturing establishment in Washington. Opportunities may exist in communities not indicated here; perhaps not every opening recorded would justify the erection of a factory. In general, however, these tabulations reflect conditions in the state as a whole and the universal need for additional plants of various kinds.

In studying these lists, it will be observed that in some localities plants similar to those requested have already been established and that in other cases the same industry is being requested by several neighborhoods not far apart. Where this

latter condition exists, it may be considered almost conclusive that one or more such plants are needed somewhere in the vicinity. If properly located, it would serve more than one of the communities now requesting it. Careful investigation in each instance will reveal to the experienced person just which localities offer the best inducements for his line; also whether it would pay to start a plant in a community already possessing one of that kind. These are points for the manufacturer himself to decide.

PRINCIPAL DEMANDS.

A hasty glance at the table shows that the most widely distributed demands next to canneries and by-product plants for utilizing surplus fruits and vegetables, fully discussed in a special chapter, are establishments for conserving other food materials. These are flour and cereal mills, as referred to in the chapter on "Manufactures from Cereals," and factories for utilizing dairy products, as discussed in the chapter entitled "Dairy and Other Livestock Products." The tables show that thirty-seven towns, most of which are located in the wheat belt on the east side of the mountains, ask for flour mills and sixty-eight communities scattered throughout the state are asking for creameries, cheese factories and milk condenseries.

Next in importance after food products come the timber products, and closely following them are those establishments depending upon the mineral resources, both metallic and non-metallic, all of which have been considered in separate chapters.

For the utilization of forest products, sawmills are requested by fifty communities, paper mills by sixteen, and shingle mills by twelve; while ten localities ask for woodworking plants, ten for furniture factories, nine for sash and door factories, twenty-four for box factories, and fifteen for shipyards.

Requests for plants to utilize non-metallic minerals include fifteen for brick and tile factories, eight for pottery plants, one for briquettes, two for coal by-products, two for glass, two for silica mills, one for marble, three for cement, three for concrete blocks and four for lime. Metal working plants include six requests for smelters, one for ore concentrator and several for foundries or other iron working establishments.

MISCELLANEOUS DEMANDS.

There are also four requests for alfalfa mills, four for broom factories, two for shoe factories, five for strawboard factories, six for fish canneries, two for codfish packing, four for laundries, two for woolen mills, three for the development of water power, one for a tannery, and one for packing house; also demands for establishments to manufacture aprons, bottles, buttons, charcoal, cigars, tannic acid, trunks and various other miscellaneous products. Altogether, about five hundred requests are tabulated and 275 different communities are represented.

ARRANGEMENT OF MATERIAL.

For the sake of convenience to the investigator, these tables have been arranged two ways, the first by industry needed and the second by the cities requesting them. The cities have been grouped by counties in order that one may more readily observe what contiguous communities request similar factories. The alphabetical plan has been followed in all arrangements.

A sulphurous acid plant near Port Townsend.

MANUFACTURING ESTABLISHMENTS REQUESTED BY CITIES, TOWNS AND VILLAGES.

Dagger (†) indicates that similar enterprise is already operating in community.
Star (*) indicates commercial organization; where none is given make inquiry of postmaster.

Name of Enterprise, Postoffice and County	*Probable Capital Required*	*Material Available*	*Encouragements Offered*
Alfalfa Mill			
*Mabton, Yakima	$10,000	Large acreage	Site and ass't.
*Topinish, Yakima	.....	Great quantity	Liberal support.
*Yakima, Yakima	10,000	20,00 acres	Cheap sites.
Apron Factory			
*Bremerton, Kitsap	.....	.....	
Bottling Works			
*Puyallup, Pierce	.....	.....	
Box Factory			
*Arlington, Snohomish	.....	.....	
Carlisle, Grays Harbor	10,000	Much spruce	
*Centralia, Lewis	3-5,000	Large amount	Substantial.
Chattaroy, Spokane	.....	.....	Probably site.
Chester, Spokane	.....	.....	
*Colville, Stevens	10-15,000	Abundant	Free site.
*Goldendale, Klickitat	.....	Fine pine	
Keller, Ferry	.....	.....	
Kennydale, King	.....	Much lumber	
Kirkland, King	.....	Large supply	Assistance.
*Lyle, Klickitat	5-10,000	.....	
Malott, Okanogan	.....	.....	
*Marysville, Snohomish	.....	.....	
*Monroe, Snohomish	.....	.....	
*Montesano, Grays Harbor	.....	Abundant	
*North Bend, King	.....	Plenty	
*Northport, Stevens	.....	.....	
*†Orient, Ferry	1,500	Within mile	
*Port Orchard, Kitsap	3,000	Yes	Liberal aid.
*Steilacoom, Pierce	.....	.....	Site.
*Sylvan, Pierce	5,000	.....	Site.
Tiger, Pend Oreille	.....	Abundant	Site.
*Vashon, King	5,000	Shipped in	
Winesap, Chelan	10,000	Abundant	Assistance.
Brick and Tile			
Battleground, Clarke	3,000	Plenty	
*Centralia, Lewis	5-6,000	Convenient	Substantial.
*Cheney, Spokane	.....	Good supply	
*Chehalis, Lewis	Small	Excellent clay	Assistance.
*Colville, Stevens	.....	Two deposits	Site.
Granger, Yakima	30-50,000	Large quantity	
*Kittitas, Kittitas	.....	Clay tests well	
Littell, Lewis	2,000	40 acres fine clay	
Marble, Stevens	500	Good supply	
Othello, Adams	Small	Cheap and near	
*Port Angeles, Clallam	3-15,000	Abundant	Long lease.
Roslyn, Kittitas	Small	Plenty	
Ruff, Grant	.....	Clay 10 miles	
Wahluke, Grant	.....	Abundant	
*Winlock, Lewis	Small	Close to plant	

Name of Enterprise, Postoffice and County	*Probable Capital Required*	*Material Available*	*Encouragements Offered*
Briquetting Plant			
*Castle Rock, Cowlitz	.....	Plenty of coal...	
Broom Factory			
*Bellingham, Whatcom	1-5,000	Wood for handles	
Colville, Stevens	.....	Can be raised...	
Methow, Okanogan	.....	.....	
Sultan, Snohomish	.....	.....	
Button Factory			
*Montesano, Grays Harbor.	.....	Plenty of shells..	
Cannery or Evaporator			
Algona, King	1-3,000	Abundance	Assistance.
*Auburn, King	20,000	.....	
Benton City, Benton	40,000	Fruit and veg...	Site.
Byron, Yakima	500-1,000	.....	
*†Carnation, King	20,000	.....	Cooperation.
Carson, Skamania	Small	.....	
*Centralia, Lewis	2,000	Much fruit.....	Assistance.
Chetlo, Pacific	1,500	.....	
Clarkston, Asotin	10,000	.....	Assistance.
Colfax, Whitman	5,000	Fruit and veg...	Assistance.
Deep River, Wahkiakum..	2,500	Much fruit.....	Cheap site.
Dewey, Skagit	Small	.....	Site.
Elma, Grays Harbor	5,000	.....	Assistance.
Factoria, King	10,000	.....	Site.
*Farmington, Whitman	.....	Abundance	Assistance.
Ferndale, Whatcom	2,000	.....	
Forks, Clallam	3-5,000	Plenty fruit....	
*Gifford, Stevens	Small	.....	Site.
*Goldendale, Klickitat	.....	.....	
Grandview, Yakima	20-25,000	Large acreage...	Site.
Grant, Mason	.....	Berries	
*Hanford, Benton	10,000	Abundant	Site and stock.
Harvey, Stevens	5,000	.....	Site.
*Kennewick, Benton	25-30,000	Hundreds of acres.	Assistance.
Kennydale, King	.....	.....	
*Kent, King	10-15,000	.....	
Kiona, Benton	Small	.....	
†Langley, Island	5,000	.....	Assistance.
Lincoln, Lincoln	5,000	.....	Site.
Lisabeula, King	Small	Fruit and berries	
Littell, Lewis	10,000	Fruit and berries	Assistance.
Loomis, Okanogan	3,000	.....	
*Mabton, Yakima	5-10,000	.....	Site.
Manson, Chelan	5,000	Unlimited	Support.
Matlock, Mason	Small	Large amount...	Assistance.
Marysville, Snohomish	.....	.....	
Medina, King	.....	.....	
*Methow, Okanogan	1,000	Soft fruits.....	
Monitor, Chelan	500-1,000	Fruit	
Mossyrock, Lewis	2,000	Fruit	
*Mt. Vernon, Skagit	25,000	.....	
Nellita, Kitsap	1,000	.....	Site.
North Bend, King	Small	.....	

Name of Enterprise, Postoffice and County	*Probable Capital Required*	*Material Available*	*Encouragements Offered*
Cannery or Evaporator—Cont.			
Orchards, Clarks	.....	Berries	Site.
Oroville, Okanogan	8-20,000	Abundant	Site.
Palisades, Douglas	1,500	700 a. orchard..	Site and ass't.
Peach, Lincoln	3-4,000	Fruit	
*Portage, King	5,000	.....	
*Port Orchard, Kitsap	5,000	Near	Liberal.
Poulsbo, Kitsap	2,000	Small fruits....	Reasonable.
Randle, Lewis	.....	.....	
*Renton, King	.....	.....	
*Rolling Bay, Kitsap	2,000	Fruit and veg...	Assistance.
*Sequim, Clallam	25,000	Good fruit dist..	Site and bonus.
Sifton, Clarke	.....	Fruit district...	Site.
South Colby, Kitsap	7,000	Near	
Stratford, Grant	.....	Sufficient	
Steilacoom, Pierce	Small	Large amount...	Site.
Sultan, Snohomish	.....	.....	Site.
Sumas, Whatcom	3-4,000	Berries	Site.
Sundale, Klickitat	.....	.....	Site.
Swofford, Lewis	8-10,000	Plenty fruit....	
*Sylvan, Pierce	5,000	Plenty	Site.
Tekoa, Whitman	.....	Garden produce.	Assistance.
Timber Valley, Klickitat..	.....	.....	Site.
Touchet, Walla Walla	.....	.....	
Tracyton, Kitsap	Small	Fruit and berries	
Tukwila, King	5,000	Fine fruit belt..	
†Vashon, King	.....	.....	
*Walla Walla, Walla Walla.	.....	Fine fruit.....	
Wawawai, Whitman	Small	.....	
*Wenatchee, Chelan	.....	Much fruit.....	
West Sound, San Juan...	15-20,000	Abundant	
*White Salmon, Klickitat..	.....	.....	
*Winslow, Kitsap	.....	Small fruit.....	
*Woodland, Cowlitz	.....	Fruit and veg...	
*†Yakima, Yakima	75,000	.....	Liberal.
*Zillah, Yakima	Small	Abundance	
Cement Works			
*Asotin, Asotin	200,000	Unlimited	
Berlin, King	.....	In abundance...	
Hartford, Snonomish	1,000,000	In abundance...	Site.
Cereal and Feed Mill			
*Anacortes, Skagit	.....	Locally grown...	Assistance.
*Burlington, Skagit	.....	Locally grown...	Site.
*Northport, Stevens	1,000	Locally grown...	
Charcoal			
Roslyn, Kittitas	Small	Plentiful	
Cheese Factory			
Ariel, Cowlitz	2-300	Dairying	Site.
*Auburn, King	5,000	Much milk.....	
Clinton, Island	3-5,000	Abundance	Site.
*Colville, Stevens	.....	.....	Site.
East Stanwood, Snohomish	10,000	Dairy country ..	Assistance.

Name of Enterprise, Postoffice and County	*Required Capital Probable*	*Material Available*	*Encouragements Offered*
Cheese Factory—Continued.			
Eden, Wahkiakum	5,000	.....	
*Ellensburg, Kittitas	Small	Dairy region	Assistance.
Etna, Clarke	3-4,000	Dairy region	Site.
Hunters, Stevens	5,000	.....	
Kapowsin, Pierce	Small	Dairy region	Site and ass't.
Oakville, Grays Harbor	3,000	Dairy region	Site.
*Quiniault, Grays Harbor	2,500	Dairy region	Site.
Stowe, Douglas	Small	.....	Free lease.
Swofford, Lewis	5,000	.....	
Van Buren, Whatcom	.....	Abundance	
Cigar Factory			
*Puyallup, Pierce	Small	.....	
Coal By-Products			
Factoria, King	250,000	Cheap coal	Site and siding.
*Issaquah, King	400,000	Abundance	
Codfish Packing			
*Anacortes, Skagit	.....	Abundance	Assistance.
Poulsbo, Kitsap	25-50,000	Unlimited	Reasonable.
Concrete Blocks			
Burbank, Walla Walla	800	Excellent	Site.
Keller, Ferry	500	Plenty	
*Port Orchard, Kitsap	500	Plenty	Assistance.
Cooperage Plant			
*Hoquiam, Grays Harbor	.....	Abundance	Site.
Creamery			
Adrian, Grant	2-3,000	Abundant	Site.
Algona, King	1-2,000	For small plant.	
Almota, Whitman	5,000	.....	
*Auburn, King	5,000	Much milk	
Carson, Skamania	2,000	.....	Support.
Cedonia, Stevens	.....	Shipping cream.	Site.
Chattaroy, Spokane	.....	Shipping cream.	Site.
Clayton, Stevens	Small	Shipping cream.	
Clinton, Island	3,000	Dairying	Site.
Cosmopolis, Grays Harbor.	5,000	Dairy country	
Dorr, Klickitat	Small	.....	
Edwall, Lincoln	.....	Dairy country	
Fishtrap, Lincoln	Small	.....	Site.
*Gifford, Stevens	.....	Shipping cream.	Site.
Gig Harbor, Pierce	7-8,000	Abundant	
*Goldendale, Klitckitat	.....	.....	
Graham, Pierce	Small	.....	
Hover, Benton	Small	Dairying	
Kendall, Whatcom	3-5,000	300 cows	
*Kittitas, Kittitas	.....	.....	
Latah, Spokane	5,000	.....	
Lawrence, Whatcom	.....	.....	

Name of Enterprise, Postoffice and County	*Probable Capital Required*	*Material Available*	*Encouragements Offered*
Creamery—Continued.			
Matlock, Mason	Small	Dairy section	Site.
Mayfield, Lewis			
Mount Solo, Cowlitz	5-10,000	Fine herds	
*North Bend, King			
*Northport, Stevens	1-5,000	Dairy country	
Oakville, Grays Harbor	3,000	1,000 cows	Site.
Pe Ell, Lewis	500-1,000	Good dairy land.	
Prescott, Walla Walla	5-10,000		Site.
*Quiniault, Grays Harbor	2,500	Dairy region	Site.
Ramapo, Clallam	3,000	Dairying	
Renton, King			
Spangle, Spokane	Small	Shipping cream	
Steilacoom, Pierce	Small		
Timber Valley, Klickitat		Plenty of cows	
Touchet, Walla Walla	2,500	Plenty of cows	Site.
Valley, Stevens		Plenty of cows	
Evaporator—(See Cannery or Evaporator)			
Fish Cannery			
Chinook, Pacific			
Dewey, Skagit		Puget Sound	Site.
†Kelso, Cowlitz			
Mukilteo, Snohomish			
Nellita, Kitsap			
Pysht, Clallam			
Flour Mill			
Adrian, Grant			Site.
Albion, Whitman			
Alderdale, Klickitat	10-20,000	Plenty	Site.
Alstown, Douglas	4-5,000	Plenty	
Alta Vista, Lewis	4-5,000	Local wheat	
Bonita, Douglas		Plenty	Site.
Chelan Falls, Chelan			
†Cheney, Spokane	15,000	Plenty	Substantial help
Clarkston, Asotin	17,000		
Connell, Franklin	20-50,000	Fine wheat	Site.
Edwall, Lincoln	15-20,000	350,000 bushels.	
Ephrata, Grant	50,000	Million bu. wheat	Site.
Huntsville, Columbia	10-20,000		
Kahlotus, Franklin		Plenty	
Krupp, Grant		7,000,000 bu.	
Leavenworth, Chelan			Site and ass't.
Lyle, Klickitat	5-10,000		Site.
Moses Lake, Grant		Plenty	Help.
Nespelem, Okanogan			
Oroville, Okanogan		Plenty	Site.
Othello, Adams		Abundant	
*Palouse, Whitman	40,000	Abundant	Assistance.
*Pateros, Okanogan	20,000	Large quantities.	Site.
*Quincy, Grant	10,000	Ample	Site.
*Ritzville, Adams	40,000		Site.

Name of Enterprise, Postoffice and County	*Probable Capital Required*	*Material Available*	*Encouragements Offered*
Flour Mill—Continued.			
*Rosalia, Whitman	25,000	Grain	Assistance.
Ruff, Grant	20-30,000	High quality	
Spangle, Spokane			
St. John, Whitman	10,000	Large amount	
Starbuck, Columbia	15,000	Abundant	
Synarep, Okanogan	5-6,000	Abundant	
Sundale, Klickitat		50,000 bushels	Aid.
*Toppenish, Yakima			Assistance.
Touchet, Walla Walla			
Twisp, Okanogan	10-12,000	Plenty	
Uniontown, Whitman	10,000	Plenty	
Warden, Grant	25,000	Good wheat	Site.
Washtucna, Adams	50,000	Abundant	Site.
Weber, Adams		Abundant	
Foundry and Machine Shop			
*†Anacortes, Skagit			Assistance.
Tuckwila, King	500,000	Cheap coal	
Furniture			
*Anacortes, Skagit	Small	Abundant	Assistance.
*Bellingham, Whatcom	5-50,000	Abundant	Cooperation.
Coupeville, Island	Small	Rustic timber	Site.
*†Everett, Snohomish	50,000	Locally	Assistance.
*Hoquiam, Grays Harbor			Site.
*Port Angeles, Clallam	2,000	Abundant	Site.
*Renton, King			
*Sumner, Pierce			
*Vancouver, Clarke	10-25,000		Assistance.
Washougal, Clarke		Plenty	Assistance.
Fruit By-Products			
*Cashmere, Chelan	10,000	Much waste	Site.
Chelan Falls, Chelan	Small	Much waste	
Denison, Spokane		Much waste	
Dryden, Chelan			
Entiat, Chelan		Much waste	
Farmington, Whitman		Much waste	
Ferndale, Whatcom	2,500		
Four Lakes, Spokane		Much waste	
Kiesling, Spokane	10,000	Waste fruit	
Mabton, Yakima	Small		
Orondo, Douglas	Small	Much waste	Free lease.
Peshastin, Chelan	3-4,000		
*Pullman, Whitman			
*Rosalia, Whitman	2,000		Aid.
Throp, Kittitas		Waste fruit	
*Toppenish, Yakima		Waste fruit	
*Yakima, Yakima	Small	Much waste	Aid.
Glass			
*Port Angeles, Clallam		Abundant	Assistance.
*Spokane, Spokane	100,000	Abundant	Assistance.

Name of Enterprise, Postoffice and County	*Probable Capital Required*	*Material Available*	*Encouragements Offered*
Implement			
Lind, Adams	20,000	Ship in	Site and bonus.
*Odessa, Lincoln			
*Ritzville, Adams		Imported	Site.
Laundry			
Ferndale, Whatcom	1,500		
Marcus, Stevens			
*Quincy, Grant			
*Rosalia, Whitman			
Lime Plant			
Dolphin, San Juan		Small mountain.	
Granite Falls, Snohomish	5,000	Agricultural rock	
Lochloy, Snohomish		Large deposits	
Orondo, Douglas		Inexhaustible	
Malleable Iron Works			
*Hoquiam, Grays Harbor		Import	Sites.
*Vancouver, Clarke	10-25,000	Import	Assistance.
Marble Works			
Marble, Stevens		Large supply	
Milk Condensery			
*Arlington, Snohomish			
*Burlington, Skagit		6,000 cows	Site.
Cheney, Spokane	5-10,000	Sufficient	Site.
Ellensburg, Kittitas		Plenty milk	
Eveline, Lewis		Local supply	Lease.
McMurray, Skagit			Site.
*Montesano, Grays Harbor			
Orchards, Clarke			Assistance.
Orting, Pierce		Lots of milk	Assistance.
Ridgefield, Clarke		Many cows	
*Sequim, Clallam	50,000	3,000 cows	Site and bonus.
*Sumner, Pierce		Sufficient	
*Walla Walla, Walla Walla	25-50,000	Plenty	Site.
*Woodland, Cowlitz		Large amt. milk.	Assistance.
*Yakima, Yakima			Assistance.
Ore Concentrator			
Covada, Ferry	2,500	$60,000 ore on dumps.	
Packing House			
Loomis, Okanogan	Small		
Paper Mill			
*Aberdeen, Grays Harbor	1,000,000	Large quantities.	Assistance.
Bay City, Grays Harbor	500,000-1,000,000	Large quantities	

Name of Enterprise, Postoffice and County	*Probable Capital Required*	*Material Available*	*Encouragements Offered*
Paper Mill—Continued.			
*Bellingham, Whatcom	50,000	Vast amount	Assistance.
*Castle Rock, Cowlitz	200,000	Wood and power	Site.
Cosmopolis, Grays Harbor	.....	.....	Site.
*Hoquiam, Grays Harbor	.....	.....	Assistance.
Keller, Ferry	.....	Cottonwood and spruce.	
Locke, Pend Oreille	.....	Plenty	
Metaline Falls, P. Oreille	.....	Wood and power	
*Monroe, Snohomish	.....	.....	Assistance.
*Northport, Stevens	50,000-100,000	Plenty	
*Renton, King	.....	.....	
*Snohomish, Snohomish	.....	Plenty	
Telma, Chelan	2,000	Cottonwood	Assistance.
Tiger, Pend Oreille	.....	Plenty of wood	
*Vancouver, Clarke	50,000-100,000	Abundant	Assistance.
Pickle Plant			
Cheney, Spokane	.....	Plenty	Assistance.
*Sumner, Pierce	.....	Vinegar produced	
Wheeler, Grant	.....	Abundant	
Piles			
*Quilcene, Jefferson	25,000	100,000 pieces	
Pottery			
*†Bellingham, Whatcom	25-75,000	.....	
Deer Park, Spokane	10,000	.....	
*Edmonds, Snohomish	.....	Excellent	
*Kelso, Cowlitz	.....	Good clay	Assistance.
Lyle, Klickitat	4-5,000	.....	
Orondo, Douglas	.....	Inexhaustible	
*Spokane, Spokane	35-50,000	Sufficient	
Tahuya, Mason	.....	Good clay	
Sash and Door			
*Blaine, Whatcom	.....	.....	
*Castle Rock, Cowlitz	.....	Abundant	Assistance.
*Centralia, Lewis	3-5,000	Plenty	Assistance.
*Chehalis, Lewis	25,000	.....	Assistance.
*†Hoquiam, Grays Harbor	.....	Abundant	Assistance.
Lakeview, Pierce	10,000	.....	
Lyle, Klickitat	5,000	.....	
Stevenson, Skamania	250	.....	Assistance.
*Winlock, Lewis	10,000	Local mills	Site and material.
Saw Mill			
Alder, Pierce	1000,000	Large quantity.	Free site.
Allyn, Mason	Small	.....	
Bangor, Kitsap	2,000	Plenty	
Berlin, King	25-50,000	Million ft. fir	Site.
Bismark, Pierce	20,000	Plenty	

Name of Enterprise, Postoffice and County	*Probable Capital Required*	*Material Available*	*Encouragements Offered*
Saw Mill—Continued.			
Camden, Pend Oreille	8,000	Some	
Corvalis, Cowlitz	100,000	Close	
Cathlamet, Wahkiakum	10,000	Plenty	
*Chehalis, Lewis	25,000	Unlimited	Assistance.
Detroit, Mason			
Elbe, Pierce	100,000	Plenty	
†Entiat, Chelan	100,000	Millions feet	
Frances, Pacific		Plenty	
Grays River, Wahkiakum	5-10,000	Abundant	
Hadlock, Jefferson	Any amt.		
Houghton, King	Small		Site.
†Kapowsin, Pierce		Plenty	
Keller, Ferry	Small	Near	
Langley, Island	Small	Plenty	
*Lincoln, Lincoln	5,000	Plenty	Site.
Lindberg, Lewis	30,000	Unlimited	
*Lyle, Klickitat	25,000-100,000	Billion feet	Site.
Marble, Stevens		15,000,000 feet	
Melbourne, Grays Harbor		All around	
Nespelem, Okanogan			
†Olympia, Thurston		Plenty	
Orin, Stevens		Plenty	
Orting, Pierce	5-20,000	Plenty	
Park Rapids, Stevens	4-10,000	Plenty	
Pateros, Okanogan	20,000	Four billion feet.	Site.
Pe Ell, Lewis		Plenty	
Piedmont, Clallam	2-3,000	Abundant	
*Port Townsend, Jefferson	35,000	Abundant	
Puget, Thurston		Plenty	
Pysht, Clallam		Large amount	
*Quilcene, Jefferson	25,000	Unlimited	
Reeveton, Clallam	25,000-100,000	Unlimited	Site.
Saratoga, Island	2,000	Large amount	Site.
Silverton, Snohomish	5-10,000	Plenty	
South Prairie, Pierce	5-20,000	Plenty	Help.
Steilacoom, Pierce		Plenty	
Synarep, Okanogan	10,000	Plenty	
Tahuya, Mason	15,000	Plenty	
†Timber Valley, Klickitat	5,000	Plenty	
*Toledo, Lewis	Small		
Tum Tum, Stevens	10,000		Site.
Turk, Stevens	5-10,000	Plenty	
Union City, Mason		Plenty	Site.
*White Salmon, Klickitat			
*Woodland, Cowlitz		Up Lewis river	Assistance.
Shingle Mill			
Berlin, King	5,000	Plenty of cedar	
Buckley, Pierce	2,000	Plenty of cedar	
*Carnation, King	15-25,000	Sufficient	Cooperation.
Cathlamet, Wahkiakum	10,000	Large bodies of timber.	

Name of Enterprise, Postoffice and County	*Probable Capital Required*	*Material Available*	*Encouragements Offered*
Shingle Mill—Continued.			
Gardiner, Jefferson	.....	Plenty of cedar..	Site.
Gig Harbor, Pierce	.....	Plenty	
Melbourne, Grays Harbor	.....	Plenty	
*†Orting, Pierce	3-5,000	Nearby	
*Quilcene, Jefferson	20,000	Plenty of cedar..	
Scenic, King	8-10,000	Plenty of cedar..	
Shine, Jefferson	4,000	Plenty of cedar..	
Stabler, Skamania	5,000	Plenty of cedar..	
Ship Building			
*Anacortes, Skagit	3-5,000	Much lumber...	Assistance.
Blaine, Whatcom	.....	.....	
Cosmopolis, Grays Harbor	.....	Lumber and site.	Free site.
Everett, Snohomish	100,000-300,000	Abundant	Free site.
†Hadlock, Jefferson	.....	Good material...	Lease of site.
†Kirkland, King	.....	Fresh water harbor.	Site.
Mukilteo, Snohomish	.....	.....	
*Port Orchard, Kitsap	30,000	Near at hand...	Site.
*Port Townsend, Jefferson	10,000	Available	Site and aid.
*Poulsbo, Kitsap	25,000-100,000	Available	Assistance.
Raymond, Pacific	.....	.....	2 sites.
*Rolling Bay, Kitsap	.....	Available	
*South Bend, Pacific	.....	Plenty; also foundry.	Support.
*Snohomish, Snohomish	.....	.....	
Steilacoom, Pierce	.....	Convenient	Aid.
*†Vancouver, Clarke	25,000	Abundant	Site and ass't.
Shoe Factory			
*Spokane, Spokane	40-75,000	Imported	Assistance.
*Vancouver, Clarke	10-25,000	Imported	Aid.
Silica Mill			
†Roza, Kittitas	10,000	Abundance	
Wymer, Kittitas	4-5,000	Vast deposits...	
Silo Factory			
*Colville, Stevens	.....	Good	Site.
Smelter			
Glacier, Whatcom	.....	Low grade ore..	
Manson, Chelan	.....	Low grade ore..	
Miles, Lincoln	.....	Large bodies ore.	
Pateros, Okanogan	.....	Large bodies ore.	Site.
Silverton, Snohomish	.....	Large bodies ore.	
Winthrop, Okanogan	10,000	Plenty	Site.

Name of Enterprise, Postoffice and County	*Probable Capital Required*	*Material Available*	*Encouragements Offered*
Sugar Factory			
*Ellensburg, Kittitas	.....	Fine beets.....	
Kittitas, Kittitas	.....	Fine beets.....	
Mabton, Yakima	500,000	Fine beets.....	
*Orting, Pierce	.....	Good beet land..	Assistance.
*Ritzville, Adams	.....	.....	Sites.
Starch Factory			
*Chehalis, Lewis	.....	Plenty potatoes..	
*Kelso, Cowlitz	.....	Plenty potatoes..	
*Montesano, Grays Harbor.	.....	.....	
Ridgefield, Clarke	.....	Many potatoes..	
*Ritzville, Adams	.....	.....	Site.
*Toppenish, Yakima	.....	Fine potatoes...	
*Waterville, Douglas	.....	Cheap potatoes..	Assistance.
Strawboard and Paper			
*Anacortes, Skagit	.....	LaConner flats..	Assistance.
*Burlington, Skagit	.....	Lots of straw...	Site.
Palouse, Whitman	100,000	Abundant straw.	
*Pullman, Whitman	.....	Abundant straw.	
*Walla Walla, Walla Walla.	.....	Abundant straw.	
Tanic Acid Factory			
*Port Angeles, Clallam ...	5,000	Hemlock bark...	Assistance.
Tannery			
*Port Angeles, Clallam ...	15,000	Import hides....	Assistance.
Ties (railroad)			
†Pigeon Springs, Cowlitz...	2-4,000	Plenty tie timber	
Toy Factory			
*South Bend, Pacific	.....	Plenty of lumber	Assistance.
Trunk Factory			
*†Spokane, Spokane	15-25,000	Local and imported.	Assistance.
Water Power Development			
Gettysburg, Clallam	10,000	Lyre river.....	
*Lyle, Klickitat	25-50,000	Klickitat river..	
*Quilcene, Jefferson	100,000	Quilcene river...	
Woodworking Plant			
Deep River, Wahkiakum..	20,000	Several mills....	Site.
*†Hoquiam, Grays Harbor..	.....	Much lumber....	Assistance.
*Kelso, Cowlitz	.....	Local mills.....	Assistance.
Leese, Okanogan	5,000	Four mills.....	
Orting, Pierce	10,000	Much timber....	Cheap site.
*Poulsbo, Kitsap	1-50,000	Some kinds.....	Aid.
Woolen Mill			
Pasco, Franklin	50,000	Vicinity.....	Site.
*Wenatchee, Chelan	.....	Vicinity	
Wool Scouring			
*Pasco, Franklin	10,000	Vicinity	Site.

A Puget Sound fishing fleet. "Washington's fisheries resources are the greatest of all states in the union and also the best fish, species for species."

CITIES, TOWNS AND VILLAGES REPORTING OPENINGS FOR MANUFACTURING ENTERPRISES; ARRANGED BY COUNTIES.

ABBREVIATIONS USED.

Bellingham & Northern.....B. & N.
Branch .....Br.
Canadian Pacific .....C. P.
Chicago, Milwaukee & St. Paul .....C. M. & St. P.
Great Northern .....G. N.
Interurban .....Int.
Northern Pacific .....N. P.
Oregon-Washington Railroad & Navigation Co. .....O.-W.
Seattle, Portland & Spokane.....S. P. & S.
Spokane Falls Northern.....S. F. N.
Spokane International .....S. I.
Steamer .....Str.
Tacoma Eastern .....T. E.
Wenatchee Valley & Northern....W. V. N.

* Indicates a commercial organization in community; where none exists make inquiry of postmaster.

County and City or Postoffice	Population 1910 Census	Population 1917 Estimate	Transportation	Resources	Industries Requested
ADAMS					
Lind	831	1,000	G. N.; C. M. & St. P.	Farming; wheat	Traction engine factory.
*Othello	.....	600	C. M. & St. P.	Farming; wheat	Small brick yard; flour mill.
*Ritzville	1,859	2,300	N. P.	Farming; wheat	Beet sugar factory; starch factory; combine harvester factory; flour mill.
Washtucna	300	350	S. P. & S.; O.-W.	Wheat raising	Flour mill.
Webber	.....	.....	N. P.	Wheat raising	Flour mill.
ASOTIN					
*Asotin	820	1,400	Steamer	Cement material	Cement factory.
*Clarkston	.....	1,700	.....	Farming	Fruit dryer; flour mill.
BENTON					
Benton City	.....	50	N. P.; O.-W.	Farming; fruit	Cannery and evaporator.
*Hanford	.....	250	Br. C. M. & St. P.	Farming; fruit	Cannery.
Hover	.....	100	S. P. & S.	Farming; fruit	Creamery.
*Kennewick	1,219	2,000	N. P.; S. P. & S.; Br. O.-W.; steamer.	Farming; fruit	Cannery.
CHELAN					
*Cashmere	.....	1,000	G. N.	Farming; fruit	Fruit by-products.
*Chelan Falls	.....	125	G. N.; steamer	Farming; fruit	Cannery; flour mill.
Dryden	.....	.....	G. N.	.....	Fruit by-products.
*Entiat	.....	300	G. N.	Farming; fruit	Fruit by-products; saw mill; box factory.

*Leavenworth	1,551	2,100	G. N.; W. V. N.	Farming; fruit	Flour mill.
*Manson	.....	300	Auto to railroad	Mining; orcharding	Smelter; cannery.
Monitor	.....	30	G. N.	Farming; orcharding	Fruit drying plant.
Peshastin	.....	.....	G. N.	Farming; orcharding	Fruit by-products.
Telma	.....	150	Stage	.....	Pulp mill.
*Wenatchee	4,050	6,300	G. N.	Farming; orcharding	Evaporator; cannery; woolen mill.
Winesap	.....	175	G. N.; river	Farming; mining	Box factory.
CLALLAM					
Forks	.....	150	Stage to Sound	Farming; timber	Cannery.
Gettysburg	.....	100	C. M. & St. P.; steamer	Timber	Drain tile; power development.
Piedmont	.....	25	5 miles to railroad; lake	Timber	Saw mill.
*Port Angeles	2,286	5,500	C. M. & St. P.; steamer	Timber, etc.	Tannic acid; tannery; furniture; brick and tile.
Pysht	.....	25	Steamer	Timber; fishing	Saw mill; pulp mill; salmon cannery.
Ramapo	.....	.....	C. M. & St. P.; auto stage	Dairying	Creamery.
Reeveton	.....	.....	C. M. & St. P.	Timber	Saw and shingle mill.
*Sequim	.....	600	C. M. & St. P.; steamer	Dairying; farming	Condensery; cannery; nursery.
CLARKE					
Battleground	.....	400	N. P. branch	Timber	Brick and tile.
Brush Prairie	.....	125	N. P.; auto truck	Farming; dairying	Creamery.
Etna	.....	45	Steamer	Farming; dairying	Cheese factory.
Orchards	.....	400	Auto truck; interurban	Farming; fruit	Condensery; cannery.
*Ridgefield	.....	600	Rail and water	Dairying; farming	Condensery; starch factory.
Sifton	.....	.....	Rail and auto truck	Dairying; farming	Cannery.
*Vancouver	9,300	10,000	5 railroads; deepwater steamers.	Farming; fruit; dairying	Grain elevators; furniture; pulp mills; shoes; shipbuilding; iron works.
*Washougal	456	1,000	Water and rail	Farming; dairying	Furniture.
Yacolt	435	475	N. P. branch	Timber; farming	Laundry.
COLUMBIA					
Huntsville	.....	225	N. P.; O.-W.	Wheat	Flour and feed mill.
Starbuck	761	850	O.-W.	Wheat	Flour mill.
COWLITZ					
Ariel	.....	500	16 miles to railroad	Dairying	Cheese factory.
Carrolls	.....	50	Rail and water	Lumber	Saw mill.
*Castlerock	998	1,300	N. P.; O.-W.; G. N.; river	Timber; farming	Briquetting plant; pulp mill; sash and door.
*Kelso	.....	2,600	N. P.; O.-W.; G. N.; river	Timber; farming	Woodworking; fish cannery; pottery works.
Mount Solo	.....	500	Stage to Kelso	Dairying	Creamery; cheese factory.
Pigeon Springs	.....	.....	Kalama river	Timber	Tie camp.
*Woodland	384	800	River and rail	Dairying; timber	Saw and planing mill; cannery; condensery.

OPENINGS FOR MANUFACTURING ENTERPRISES—CONTINUED.

County and City or Postoffice	Population 1910 Census	Population 1917 Estimate	Transportation	Resources	Industries Requested
DOUGLAS					
Alstown	.....	29	G. N.	Wheat	Flour mill.
Bonita	.....	.....	River	Wheat	Grist mill.
Orondo	.....	250	River and rail	Fruit; farming	Pottery; lime; fruit by-products.
Palisades	.....	.....	G. N.	Fruit	Cannery.
Stowe	.....	.....	Motor truck	Dairying; fruit	Cheese factory.
*Waterville	900	1,500	G. N. branch	Fruit; farming	Starch factory; cereal mill.
FERRY					
Covada	.....	100	River	Mineral	Ore concentrator.
*Keller	.....	200	Auto	.....	Box factory; concrete blocks; paper mill.
*Orient	.....	300	G. N.	.....	Box factory.
FRANKLIN					
*Connell	.....	300	N. P.; O.-W. branch	Wheat; fruit	Flour mill.
Kahlotus	.....	200	O.-W.; S. P. & S.	Wheat	Flour mill.
*Pasco	2,083	3,500	Rail and water	Wheat; livestock	Woolen mill; wool scouring.
GARFIELD					
Peola	.....	.....	17 miles to railroad	Wheat	Blacksmith shop.
GRANT					
Adrian	.....	100	N. P.; G. N.	Dairying; wheat	Creamery; flour mill.
*Ephrata	323	550	G. N.	Wheat	Flour mill.
Krupp	.....	300	G. N.	Wheat	Flour mill.
Moses Lake	.....	100	Branch C. M. & St. P.	Fruit; wheat	Flour mill; cannery.
*Quincey	264	365	G. N.	Fruit; wheat	Flour mill.
Ruff	.....	75	C. M. & St. P.	Fruit; wheat	Flour mill; brick.
Stratford	.....	.....	G. N.	Fruit; wheat	Ice and cold storage.
Wahluke	.....	.....	River	Fruit; wheat	Brick and tile.
*Warden	.....	350	C. M. & St. P.	Wheat	Flour mill.
Wheeler	.....	50	Near C. M. & St. P.	Farming; fruit	Pickle plant.
GRAYS HARBOR					
*Aberdeen	13,600	18,333	N. P.; C. M. & St. P.; ocean	Timber	Paper and pulp mill.
Bay City	.....	60	Deepwater; railroad	Timber	Paper and pulp mill.
Carlisle	.....	800	Railroad	Timber	Box factory.

*Cosmopolis	1,132	1,800	2 railroads; N. P.; C. M. & St. P.; O.-W.	Timber; farming	Creamery; shipyard; paper mill
*Elma	1,532	2,000			Woodworking; canneries; cigar factory.
*Hoquiam	8,171	13,000	Rail and ocean	Timber	Woodworking; shipbuilding; woolen mills; pulp and paper; sash and door.
Melbourne		150	rail and water	Timber	Saw and shingle mills.
*Montesano		3,000	rail and water		Condensery; box, button and starch factories.
*Oakville	465	400	N. P.	Dairying; farming	Cheese; glove factory; cannery.
Quinlault		350	Auto truck	Dairying; timber	Creamery.
ISLAND					
Clinton		60	Steamer	Dairying; farming	Cheese and creamery.
*Coupeville	310	500	Steamer	Dairying; farming	Rustic furniture.
*Langley		400	Steamer	Dairying; farming	Creamery; cannery; saw mill; box factory.
Saratoga		100	Steamer	Dairying; farming	Creamery; cannery; saw mill; box factory.
JEFFERSON					
Gardiner		25	Rail and water	Timber	Shingle mill; box factory.
Hadlock		300	Rail and water	Timber	Ship yard; saw mill.
*Port Townsend	4,180	5,000	C. M. & St. P.; steamer	Timber	Saw and shingle mill; ship yard.
Quilcene		700	Rail and water	Timber	Piles; shingle and saw mill.
Shine		200	Steamer	Timber	Shingle mill.
KING					
Algona		500	C. M. & St. P.; interurban		Creamery and cannery.
*Auburn	957	3,000	N. P.; C. M. & St. P.; O.-W.; G. N.; interurban.	Fruit; dairying	Cheese factory; creamery; cannery.
Berlin		200	G. N.	Timber	Saw and shingle mill; cement.
*Carnation		500		Fruit; timber	Cannery; shingle mill.
Factoria		300	N. P.; lake steamers	Coal; fruit	Coal tar chemical plant; cannery.
Houghton		300	Lake Wasnington		Saw mill.
*Issaquah	628	800	N. P.	Coal; timber	Coal by-products; cannery.
Kennydale		500	Boat and rail	Timber	Box factory; cannery.
*Kent				Dairying	Bed; cannery.
*Kirkland	532	1,000	Lake Washington; N. P.	Farming	Ship yards; box factory.
*Lisabeula		250	Sound steamers	Fruits; berries	Cannery.
Medina		300	Ferry to Seattle	Farming	Cannery.
*North Bend	299	450	N. P.; C. M. & St. P.	Dairying; timber	Box factory; cannery; creamery.
Portage		150	Steamer	Fruits; berries	Cannery; vinegar plant.
*Renton		3,750	C. M. & St. P.; N. P.; Int.	Coal; lumber	Furniture; paper; creamery; cannery.
Scenic		75	G. N.	Lumber	Shingle mill.
*Seattle		366,445	All railroads and steamers	Metropolitan	All branches.
Tuckwila	361	400	Railroads; interurban	Gardening	Iron foundry; cannery.
*Vashon		500	Steamer	Fruits; berries	Box factory; cannery.

OPENINGS FOR MANUFACTURING ENTERPRISES—CONTINUED.

County and City or Postoffice	Population 1910 Census	Population 1917 Estimate	Transportation	Resources	Industries Requested
KITSAP					
Bangor		250	Sound steamer	Timber; farming	Saw and shingle mill.
*Bremerton	2,993	6,000	Sound steamer	Navy Yard	Ship yard; woodworking; apron factory.
Nellita		90	Sound steamer	Fruit; fishing	Fruit; fish cannery.
*Port Orchard	682	1,000	Sound steamer	Dairying; farming	Concrete block plant; box factory; ship yard; cannery.
*Poulsbo	364	600	Sound steamer	Fishing; farming	Woodworking; codfish packing; ship yard; cannery.
*Rollingbay		400	Sound steamer	Poultry; farming	Cannery; ship building.
*South Colby		300	Sound steamer	Farming; fruit	Cannery.
Tracyton		250	Sound steamer	Poultry; farming	Cannery.
*Winslow		300	Sound steamer	Gardening	Cannery.
KITTITAS					
*Ellensburg	4,209	7,500	N. P.; C. M. & St. P.	Farming; fruit	Sugar; cheese; milk.
*Kittitas		250	C. M. & St. P.	Farming; fruit	Creamery; sugar; brick.
Roslyn	3,126	3,000	N. P.	Coal	Charcoal; brick and tile.
Roza		75	N. P.	Farming	Silica mill.
Thorp		375	N. P.; C. M. & St. P.	Farming	Fruit by-products.
Wymer			N. P.	Farming	Silica mill.
KLICKITAT					
Alderdale		50	S. P. & S.; steamer	Wheat	Flour mill.
Dorr		1,575	Stage	Logging	Creamery.
*Goldendale			Railroad	Fruit; wheat	Box factory; cannery.
*Lyle		250	S. P. & S.; steamer	Fruit; timber; farming	Flour; sash and door; saw mill; water power; brick and pottery.
Sundale			S. P. & S.; steamer	Fruit; wheat	Flour mill; cannery.
Timber Valley		800	Logging road to S. P. & S.	Lumber	Saw mill; cannery; creamery.
*White Salmon				Fruit; dairying	Saw mill; cannery; creamery.
LEWIS					
Alta Vista		50	Auto	Farming	Flour mill.
*Centralia	7,311	11,000	Railroad center	Timber; farming	Cannery; vinegar; pickle; sash and door; brick and tile; broom handle and box.
*Chehalis	4,507	6,000	Railroad center	Timber; agriculture	Saw mill; brick and tile; fir door; starch.
Evelne			N. P.; O.-W.; G. N.	Dairying; timber	Condensery.

Lindberg		60	T. P.	Timber	Saw mill.
Littell			N. P.	Timber; farming	Cannery; brick yard.
Mayfield		30	Auto truck	Farming	Creamery; cannery.
Mossy Rock		150	Auto truck	Farming	Cannery; cheese; creamery.
*Pe Ell	838	1,200	N. P.	Timber	Saw mill; creamery.
Randle		100	Auto truck	Water power; agriculture	Cannery.
Swofford			Auto truck	Dairying; farming	Creamery and cheese factory.
*Toledo	375	450	Auto truck and steamer	Fruit; farming	Logging; cannery.
*Winlock	1,140	1,500	Main line N. P.	Timber; farming	Sash and door; brick and tile.
LINCOLN					
Edwall		300	G. N.	Wheat	Flour mill; creamery.
Fishtrap		15	N. P.	Farming; dairying	Creamery and cheese factory; feed mill.
Lincoln			G. N. and river	Water power	Cannery; saw mill; box factory.
Marshall			N. P.; S. P. & S.		General factories.
Miles		20	25 miles from railroad	Mining	Smelter.
*Odessa	885	1,350	G. N.	Wheat	Combine harvester factory.
Peach			Auto and river	Fruit	Canning factory; box factory.
MASON					
Allyn		125	Sound steamer	Timber	Saw and shingle mill; cannery.
Detroit		80	Sound steamer	Timber; fruit	Saw mill and box factory.
Grant		30	Sound steamer	Farming	Cannery.
Matlock		150	Peninsular R. R.	Timber; farming	Creamery; cheese factory; cannery.
Tahuya		40	Sound steamer	Timber	Saw mill; pottery.
Union City		75	Sound steamer	Timber	Saw mill; woodworking plants.
OKANOGAN					
Leese			G. N.		Saw mill.
*Loomis				Timber; farming	Cannery; packing plant.
Malott			G. N.	Cattle; fruit	Box factory.
*Methow		100	11 miles to railroad	Fruit; grain	Broom factory; cannery.
Molson		350		Wheat	Lime; sash and door; creamery.
Nespelem			G. N.		Flour; saw mill.
*Oroville		1,000	G. N.	Mining; fruit; farming	Cannery.
*Pateros			G. N.; river steamer	Cattle; fruit	Flour mill; smelter; saw mill.
Synarep			17 miles to railroad	Cattle; wheat; timber	Flour mill; saw and box factory.
*Twisp		400	Auto truck	Farming; cattle	Flour mill.
*Winthrop		300	Auto truck	Mining	Smelter.
PACIFIC					
Chettlo			Deepwater ships	Fish; timber	Fish and fruit canneries; saw and pulp mill.
Frances		200	N. P.	Timber	Saw and shingle mill.
Oysterville		115	Stage to railroad	Fishing	Cannery.
*South Bend	3,023	5,000	N. P.; C. M. & St. P.; Str.	Timber; fish	Ship yard; wooden toy factory.

OPENINGS FOR MANUFACTURING ENTERPRISES—CONTINUED.

County and City or Postoffice	Population		Transportation	Resources	Industries Requested
	1910 Census	1917 Estimate			
PEND OREILLE					
Camden		50	G. N.	Water power	Saw and feed mill.
Locke		20	C. M. & St. P.	Water power	Paper mill.
*Metaline Falls		300	C. M. & St. P.	Mining; timber	Pulp mill.
Tiger		75	C. M. & St. P.	Water power	Box factory; paper mill.
PIERCE					
Alder			C. M. & St. P.	Timber	Saw mill.
Bismark			T. E. and electric cars	Timber	Saw mill.
*Buckley	1,272	1,700	N. P.	Coal; timber; farming	Shingle mill; laundry.
Elbe		150	C. M. & St. P.	Timber	Shingle and saw mill.
Gig Harbor		700	Sound steamer	Timber; farming	Shingle; fish cannery; creamery.
Graham		8	C. M. & St. P.	Timber; dairying	Creamery; cheese; wood mfg. plant
Kapowsin		600	Rail	Timber; water power	Cheese; saw mill.
Lakeview		200	N. P.; G. N.	Dairying; timber	Sash and door.
*Orting	799	900	N. P.	Timber; farming	Shingle; saw; woodworking; sugar condenser.
*Puyallup	4,544	5,900	Steam and electric roads	Fruit; berries	Cigar factory; bottling works.
South Prairie	264	300	Rail	Timber; coal; clay	Shingle and saw mill.
Stellacoom	430	650	Rail and boat	Medical springs	Cannery; creamery; saw; shingle; box; ship yard.
*Sumner	892	1,750	Rail and electric	Fruit; farming	Condenser; pickle; tin; auto; furniture.
Sylvan		160	Boat	Fruit; farming	Cannery; fruit packing.
*Tacoma		120,000	All railroads and steamers	Metropolitan	All branches.
SAN JUAN					
Dolphin			Sound steamer	Limestone	Lime kiln; cement.
West Sound		150	Sound steamer	Farming	Cannery.
SKAGIT					
*Anacortes	4,168	6,000	Rail and water	Timber; fish	Furniture; strawboard; cereal; ship yard; foundry; codfish plant.
*Burlington	1,302	1,400	G. N.; electric road	Timber; farming	Condenser; cereal strawboard.
*Conway			G. N.	Dairying	Fruit and vegetable cannery.
Dewey			Rail		Fish; fruit cannery; saw mill; smelter; ship yard.
McMurray		400	N. P.	Timber	Condenser.
*Mt. Vernon	2,381	3,500	Rail and water	Dairying	Condenser; vegetable cannery.

SKAMANIA					
*Carson		250	S. P. & S.; steamer	Timber; farming	Creamery; fruit dryer.
Stabler			14 miles to railroad	Timber; farming	Shingle mill.
*Stevenson	387	800	S. P. & S.; steamer	Timber; farming	Sash and door; box; creamery.
SNOHOMISH					
*Arlington		2,200		Timber; dairying	Box factory; condensery; pottery factory.
*East Stanwood		250	G. N.; steamer	Farming; timber	Cheese.
*Edmonds		2,000	G. N.; steamer	Timber; fruit	Bottling works; general manufacturing plants.
*Everett	24,814	36,000	Rail and steamer	Timber; fish	Furniture; ship yard.
*Granite Falls	714	750	Rail	Timber; granite; coal	Lime.
Hartford		800	Rail		Cement.
Lochloy		350	N. P.		Lime.
*Marysville	1,239	2,000	Rail and water	Timber; farming	Cannery; creamery; box factory.
*Monroe	1,552	2,000	G. N.; C. M. & St. P.	Dairying; agriculture	Paper; box; cheese; brick; pickle.
*Mukilteo		700	Rail and water	Dairying; agriculture	Fish cannery; ship yard.
Silverton		100	Hartord & Eastern R. R.	Timber; mineral	Saw; shingle; smelter.
*Snohomish		5,350	G. N.; N. P.; C. M. & St. P.		Paper mill; ship yard; rubber goods factory.
*Sultan	576	850	G. N.	Timber; mining; dairying.	Cannery; broom handle.
SPOKANE					
Chattaroy		100	G. N.	Farming	Box factory; creamery.
*Cheney	1,207	1,500	Railroads	Farming; dairying	Brick; flour; vinegar and pickle; condenser.
Chester		50		Farming	Box factory.
*Deer Park	875	1,300	S. F. & N.	Timber; fruit; mining	Pottery.
Denison		80	Stage and rail	Farming	Silica mill; fruit by-products.
Green Acres		500	S. I. R. R.	Farming	Cannery.
*Four Lakes	339	500	W. W. P. Elec. R. R.	Fruit	Vinegar plant.
Kiesling			S. I. R. R.		Vinegar plant.
Latah	339	500	O.-W.	Farming	Creamery.
*Spangle	299	450	N. P.		Flour mill; creamery.
*Spokane	104,402	130,000	All railroads	Metropolitan	Shoe; glass; pottery; trunk; miscellaneous.
STEVENS					
Addy		400	G. N.	Lumbering	Saw mill.
Cedonia			Auto trucks	Farming	Creamery.
Clayton		400	S. F. & N.	Farming	Creamery.
*Colville	1,512	2,200	G. N.	Farming; timber; mining	Box, broom, brick, silo and cheese factories.
*Gifford		60	Auto truck	Farming	Cannery and evaporator; creamery.
Harvey		225	14 miles to railroad	Farming	Cannery.
Hunters		200	Auto truck	Farming	Creamery and cheese.
Marble		100	G. N.	Timber; marble	Saw mill; marble works; brick yard.
*Northport	476	1,600	G. N.	Timber; farming	Feed; pulp; box; creamery.
Orin		150	G. N.	Timber	Saw mill.

OPENINGS FOR MANUFACTURING ENTERPRISES—CONTINUED.

County and City or Postoffice	Population 1910 Census	Population 1917 Estimate	Transportation	Resources	Industries Requested
STEVENS—Concluded.					
Park Rapids	.....	.....	16 miles to railroad	Timber	Saw and shingle mill.
Tum Tum	.....	200	Auto truck	Timber	Saw mill.
Turk	.....	40	County road	Timber	Saw mill.
Valley	.....	400	S. F. & N.	Farming	Creamery or cheese factory.
THURSTON					
*Olympia	6,996	12,000	N. P.; O.-W.; steamers; stages	Timber; farming; oysters	Saw mill; ship building; brick and tile.
Puget	.....	.....	Boat	Timber	Saw mill.
WAHKIAKUM					
*Cathlamet	352	500	Deepwater steamers	Timber	Saw and shingle mill.
Deep River	.....	500	Deepwater steamers	Timber; farming	Cannery; lumber mill.
Eden	.....	125	Deepwater steamers	Farming	Cheese.
Grays River	.....	75	Deepwater steamers	Timber	Saw and shingle mill.
WALLA WALLA					
Burbank	.....	200	3 railroads; water	Fruit; farming	Concrete blocks.
*Prescott	502	700	O.-W.	Fruit; farming	Dairy products.
*Touchet	.....	600	O.-W.	Fruit; farming	Flour; creamery; fruit packing.
*Walla Walla	19,364	24,200	O.-W.; N. P.	Fruit; farming	Condensery; cannery; strawboard.
WHATCOM					
*Bellingham	24,298	35,000	Water and rail	Timber; farming	Paper; brick and tile; furniture; broom.
*Blaine	.....	3,500	Water and rail	Timber; farming	Sash and door; ship yard; cannery.
Ferndale	691	1,300	G. N.	Timber; farming	Fruit evaporator; laundry.
Glacier	.....	100	B. & N.	Mining	Smelter.
Kendall	.....	250	B. & N.	Farming	Creamery.
Lawrence	.....	200	N. P.	Timber; farming	Creamery; saw and shingle mill.
*Sumas	902	2,000	N. P.; C. P.; G. N.	Timber; farming	Cannery; cheese factory.
Van Buren	.....	.....	B. & N.	Farming	Cheese factory.
WHITMAN					
*Albion	.....	400	Branch O.-W.	Wheat	Flour mill.
Almota	.....	100	N. P.; O.-W.	Farming; wheat	Creamery; water power.
*Colfax	2,873	3,250	2 railroads	Farming; wheat	Cannery.
*Farmington	489	800	O.-W.; N. P.	Farming; wheat	Cannery; vinegar.

*Palouse	1,519	1,600	2 railroads; electric road	Farming; wheat	Flour and feed mill; straw paper mill.
*Pullman	2,607	3,000	N. P.; O.-W.	Farming; wheat	Fruit by-products.
*Rosalia	767	800	3 railroads	Farming; wheat	Cider and vinegar; laundry; flour.
*St. John	421	650	O.-W.	Farming; wheat	Flouring mill.
Tekoa	1,694	2,000	O.-W.	Farming; wheat	Cannery.
*Uniontown		650	N. P.	Farming; wheat	Flour mill.
Wawawai			O.-W.	Farming; wheat	Cannery.
YAKIMA					
Byron		180	N. P.	Fruit; farming	Cannery; fruit by-products.
Cowiche			Rail	Timber; dairying	Saw mill; creamery and cheese.
*Grandview	320	650	N. P.; O.-W.	Fruit; Farming	Cannery.
*Granger		500	N. P.; O.-W.	Fruit; Farming	Brick and tile.
Mabton	666	750	N. P.	Fruit; Farming	Cannery; alfalfa meal; sugar.
*Toppenish	1,598	2,500	N. P.	Fruit; Farming	Fruit by-products; alfalfa; grist mill; starch.
*Yakima	14,082	21,000	N. P.; O.-W.	Fruit; Farming	Evaporator; starch; broom; condenser; alfalfa; flour.
*Zillah		600	N. P.; O.-W.	Fruit; Farming	Cannery; fruit by-products.

SCENES FROM THE LIVESTOCK INDUSTRY.

No. 1. Big packing plant at Spokane. No. 2. Stock yard at Tacoma. No. 3. Hogs fattening at Kennewick. No. 4. Beef cattle feeding in the Yakima Valley.

EXPLAINING TABLES SHOWING RAW MATERIALS.

The following classifications are for the purpose of indicating the most important raw materials of the state and in what counties the bulk of them are to be found. In the first table the raw materials themselves are classified and the counties containing an appreciable amount listed after each item. The second is merely the converse of the first and is given for the sake of convenience, so that one may note readily the most common materials available in any single county or group of counties.

These tables have their limitations. For instance, certain of the more common materials listed in the classication such as fruits, berries and vegetables may be present to a certain extent in practically all the counties. In such cases it has seemed advisable to mention only those counties which have produced them in sufficient commercial quantities to constitute a real industrial factor.

The extent to which each raw material exists in any division is roughly indicated by the letters "vp" very plentiful, "p" plentiful, and "l" little. In using these signs it has been necessary to take into consideration not alone the actual quantity existing, but also its relative importance among the products of the county for which it is mentioned. An example of this is timber in Pend Oreille county which is marked "vp" because it is relatively very plentiful as compared with other resources of that county and also as compared with other neighboring districts; although in actual quantity this county has far less timber than many of the heavily forested sections of the western part of the state.

The data contained in these tables was secured from many sources, including county officials, Federal and state reports, chambers of commerce, and various individual experts; also by personal visit and investigation on the part of a representative of this bureau. While not exhaustive, they will prove a convenient reference for those who desire to survey briefly the field of opportunity offered by individual counties or to trace quickly the sections where certain resources may be found.

DISTRIBUTION OF WASHINGTON'S PRINCIPAL RAW MATERIALS AND RESOURCES.

AGRICULTURAL PRODUCTS.

BARLEY: Asotin, p; Columbia, vp; Garfield, vp; Spokane, p; Walla, vp; Whitman, vp.

BERRIES: Grown abundantly in nearly all counties. Commercial shipments from Benton, p; Clarke, p; Island, p; King, vp; Kitsap, vp; Klickitat, vp; Lewis, vp; Pierce, vp; Spokane, vp; Yakima, vp.

DAIRY: Clallam, p; Clarke, p; Cowlitz, p; Grant, l; Grays Harbor, p; Island, p; Jefferson, p; King, vp; Kitsap, p; Kittitas, vp; Lewis, vp; Okanogan, p; Pacific, p; Pierce, vp; San Juan, p; Skagit, vp; Snohomish, vp; Spokane, vp; Stevens, p; Thurston, p; Wahkiakum, p; Walla Walla, p; Whatcom, vp; Whitman, p; Yakima, vp.

FRUITS (Orchard): Asotin, p; Benton, p; Chelan, vp; Clarke, vp; Columbia, p; Cowlitz, p; Douglas, p; Ferry, l; Franklin, l; Garfield, p; Grant, p; Island, l; King, p; Kitsap, p; Kittitas, vp; Klickitat, vp; Lewis, p; Lincoln, p; Mason, l; Okanogan, vp; Pierce, vp; San Juan, p; Skagit, p; Skamania, p; Snohomish, p; Spokane, vp; Stevens, p; Thurston, p; Walla Walla, vp; Whatcom, p; Whitman, p; Yakima, vp.

LIVESTOCK: Adams, p; Asotin, p; Columbia, p; Douglas, l; Ferry, p; Garfield, vp; Grant, p; King, vp; Kittitas, p; Klickitat, p; Lincoln, p; Okanogan, vp; Pierce, p; Skagit, p; Spokane, p; Stevens, p; Whatcom, p; Walla Walla, p; Whitman, vp; Yakima, vp.

OATS: Adams, p; Clarke, p; Douglas, p; Grays Harbor, p; Island, p; Kittitas, vp; Lewis, vp; Lincoln, p; Okanogan, p; San Juan, p; Skagit, vp; Snohomish, p; Spokane, vp; Stevens, p; Thurston, p; Walla Walla, p; Whatcom, p; Whitman, vp; Yakima, p.

POULTRY: Adams, l; Clarke, p; Douglas, p; Island, p; King, vp; Kitsap, vp; Lewis, vp; Pierce, vp; San Juan, p; Snohomish, vp; Spokane, vp; Stevens, p; Thurston, p; Walla Walla, p; Whatcom, p; Whitman, vp; Yakima, vp.

SUGAR BEETS: Benton, p; Yakima, vp; Kittitas, l.

VEGETABLES: Grown abundantly in practically all counties. Large commercial shipments at present from Benton, Clarke, Columbia, Cowlitz, Kittitas, Klickitat, Lewis, Pierce, Skamania, Spokane, Walla Walla, Yakima.

WHEAT: Adams, vp; Asotin, vp; Benton, vp; Columbia, vp; Douglas, vp; Franklin, vp; Garfield, vp; Grant, vp; Kittitas, p; Klickitat, vp; Lincoln, vp; Okanogan, vp; Spokane, vp; Walla Walla, vp; Whitman, vp; Yakima, p. A softer wheat will grow in any part of western Washington.

WOOL: Asotin, p; Benton, vp; Columbia, p; Franklin, p; Garfield, p; Grant, p; Kittitas, p; Klickitat, p; Okanogan, p; San Juan, p; Stevens, p; Walla Walla, vp; Whitman, vp; Yakima, vp.

MARINE PRODUCTS.

CLAMS: Clallam, p; Grays Harbor, vp; Mason, p; Pacific, p; Thurston, p.

CRABS: Clallam, vp; Grays Harbor, vp; Pacific, vp.

FISH: Clallam, vp; Clarke, p; Cowlitz, p; Grays Harbor, vp; Island, vp; Jefferson, vp; King, vp; Kitsap, vp; Mason, p; Pacific, p; Pierce, p; San Juan, vp; Skagit, vp; Skamania, vp; Wahkiakum, vp; Whatcom, vp.

KELP: Clallam, vp; Island, p; San Juan, vp. Some kelp is found in the waters of all Sound counties.

OYSTERS: Mason, vp; Pacific, vp; Thurston, vp.

WHALES: Grays Harbor, vp.

MINERALS—NON-METALS.

CEMENT MATERIALS: Asotin, p; Chelan, p; Ferry, p; King, vp; Okanogan, p; Pend Oreille, vp; San Juan, vp; Skagit, vp; Snohomish, vp; Stevens, p; Whatcom, p.

CLAY: (Bricks are made from local clay deposits at the principal towns in more than half the counties). Adams, l; Benton, p; Chelan, p; Clallam, p; Clarke, p; Columbia, p; Cowlitz (fire and pottery), vp; Douglas (pottery), p; Ferry; Garfield; Grays Harbor, vp; Jefferson, vp; King (fire, pottery and sewer pipe), vp; Kitsap, p; Kittitas, p; Klickitat, p; Lewis (kaolin and pottery), vp; Lincoln, p; Okanogan, vp; Pacific, p; Pierce (kaolin and fire), p; Skagit, p; Snohomish, p; Spokane (sewer pipe), vp; Stevens (kaolin and pottery), p; Walla Walla, p; Whatcom, vp; Whitman; Yakima, p.

COAL:: Asotin, l; Clallam, l; Cowlitz, p; Grays Harbor (prospects); King, vp; Kittitas, vp; Lewis, vp; Pierce, vp; Skagit, p; Snohomish, p; Thurston, p; Whatcom, p.

GAS: Benton, l.

GRANITE: Garfield, l; King, p; Mason, p; Pierce, l; Snohomish, p; Spokane; Stevens; Whitman.

GYPSUM: Chelan.

LIME FLUX: San Juan, vp; Stevens, p.

LIME STONE (building): Chelan, p; Clallam, p; Ferry, p; Douglas, p; Pend Oreille, p; Snohomish, vp; Stevens, p.

MARBLE: Chelan; Lincoln, l; Snohomish, p; Spokane, l; Stevens, vp; Whatcom, l.

OIL (only prospects): Clallam, Jefferson; Lewis.

ONYX: Garfield, l.

SANDSTONE: Clallam, l; Ferry, p; King, l; Kitsap, p; Pierce, p; San Juan, p; Skagit, p; Thurston, vp; Whatcom, p:

SILICA: Benton, vp; Clallam, p; Franklin, p; Grant, vp; Kittitas, p; Spokane; Yakima.

MINERALS—METALS.

ARSENIC: King; Lewis; Okanogan; Snohomish.

COPPER: Chelan; Ferry; King; Lewis; Okanogan; Pierce; Skagit; Skamania; Snohomish; Stevens.

GOLD: Asotin; Chelan; Clallam; Clarke; Douglas; Ferry; King; Kittitas; Lincoln; Okanogan; Pend Oreille; Skamania; Snohomish; Stevens; Whatcom; Whitman; Yakima.

IRON: King; Kittitas; Skagit; Snohomish; Stevens.

LEAD: Chelan; Lewis; Lincoln; Okanogan; Pend Oreille; Skamania; Snohomish; Spokane; Stevens.

MANGANESE: Grays Harbor; Okanogan; Mason.

MOLYBDENUM: Chelan; Ferry; Okanogan; Pend Oreille; Snohomish.

QUICK SILVER: Kittitas; Lewis.

SILVER: Chelan; Ferry; Lincoln; Okanogan; Pend Oreille; Skagit; Stevens.

TUNGSTEN: Ferry; Okanogan; Spokane; Stevens.

ZINC: Okanogan; Pend Oreille; Snohomish; Stevens.

TIMBER.

Asotin, l; Chelan, p; Clallam, vp; Clarke, p; Columbia, l; Cowlitz, vp; Ferry, vp; Garfield, l; Grays Harbor, vp; Island, p; Jefferson, vp; King, vp; Kitsap, p; Kittitas, p; Klickitat, l; Lewis, vp; Lincoln, l; Mason, vp; Okanogan, p; Pacific, vp; Pend Oreille, vp; Pierce, vp; Skagit, vp; Skamania, vp; Snohomish, vp; Spokane, l; Stevens, p; Thurston, vp; Wahkiakum, vp; Whatcom, vp; Yakima, l.

WATER POWER.

Adams, l; Asotin, p; Benton, p; Chelan, vp; Clallam,vp; Clarke, p; Columbia, p; Cowlitz, vp; Ferry, p; Franklin, p; Grant, vp; Grays Harbor, p; Jefferson, vp; King, vp; Kittitas, vp; Klickitat, vp; Lewis, vp; Lincoln, vp; Mason, vp; Okanogan, p; Pacific, p; Pend Oreille, vp; Pierce, vp; Skagit, vp; Skamania, vp; Snohomish, vp; Spokane, vp; Stevens, vp; Thurston, p; Wahkiakum, vp; Whatcom, vp; Yakima, vp.

PRINCIPAL RAW MATERIALS AND RESOURCES OF WASHINGTON BY COUNTIES.

ADAMS: livestock, p; poultry, l; oats, p; wheat, vp; clay, l; waterpower, l.

ASOTIN: barley, p; fruit, p; livestock, p; wheat, vp; wool, p; coal, l; cement material, p; gold, l; timber, l; waterpower, p.

BENTON: berries, p; fruit, p; sugar beets, p; vegetables, p; wheat, vp; wool, vp; clay, p; natural gas, l; silica, vp; waterpower, p.

CHELAN: fruit, vp; cement material, p; clay, p; limestone, p; marble; mines (copper, lead, silver, gold, gypsum, molybdenum, quicksilver, zinc); timber (saw and pulp), p; waterpower, vp.

CLALLAM: dairies, p; clams, p; crabs, vp; fish, vp; kelp, vp; clay, p; coal, l; silica, p; limestone, p; sandstone, l; metals (mostly prospects), gold, l; oil (prospects); timber, vp; waterpower, vp.

CLARKE: berries, p; dairies, vp; fruit, vp; oats, p; poultry, p; vegetables, p; fish, p; clay, p; gold, l; timber, p; waterpower, p.

COLUMBIA: barley, vp; fruit, p; livestock, p; vegetables, p; wheat, vp; wool, p; clay, p; timber, l; waterpower, p.

COWLITZ: dairies, p; fruit, p; vegetables, p; fish, p; clay, vp; coal, p; timber, vp; waterpower, vp.

DOUGLAS: fruit, p; livestock, l; oats, p; poultry, p; wheat, vp; clay (pottery), p; limestone, p; gold, l.

FERRY: fruit, l; livestock, p; cement material, p; clay, p; limestone, p; sandstone, p; metals (cobalt, copper, gold, lead, molybdenum, silver, tungsten, zinc); timber, p; waterpower, p.

FRANKLIN: fruit, l; wheat, vp; silica, p; wool, p; waterpower, p.

GARFIELD: barley, vp; fruit, p; livestock, vp; wheat, vp; wool, p; clay (brick), p; granite, l; onyx, l; timber, l.

GRANT: dairies, l; fruit, p; livestock, p; wheat, vp; wool, p; potash, l; silica, vp; Soap lake mineral water; waterpower, vp.

GRAYS HABOR: dairies, p; oats, p; clams, vp; crabs, vp; fish, vp; whales, vp; manganese; clay (brick), vp; coal (prospects); oil (prospects); timber, vp; waterpower, p.

ISLAND: berries, p; fruit, l; dairies, p; poultry, p; oats, p; fish, vp; kelp, p; timber, p.

JEFFERSON: dairies, p; fish, vp; clay, vp; minerals (undeveloped); oil (prospects); timber, vp; waterpower, vp.

KING: berries, vp; fruits, p; dairies, vp; livestock, vp; poultry, vp; fish, vp; cement material, vp; clay, vp; coal, vp; granite, p; sandstone, l; metals (arsenic, copper, gold, iron), l; timber, vp; waterpower, vp.

KITSAP: berries, vp; fruit, p; dairies, p; poultry, vp; fish, vp; clay, p; sandstone, p; timber, p.

KITTITAS: dairies, vp; fruit, vp; livestock, p; oats, vp; wheat, p; vegetables, vp; sugar beets, l; wool, p; clay, p; coal, vp; metals (largely undeveloped), gold, quicksilver, iron; silica, p; timber, p; waterpower, vp.

KLICKITAT: berries, vp; livestock, p; fruit, vp; vegetables, p; wheat, vp; wool, p; clay, p; stone, p; timber, l; waterpower, vp.

LEWIS: berries, vp; dairies, vp; fruit, p; oats, vp; poultry, vp; vegetables, vp; wool, p; clay, vp; coal, vp; metals (arsenic, copper, lead, quicksilver); oil (prospects); timber, vp; waterpower, vp.

LINCOLN: fruit, p; livestock, p; oats, p; wheat, vp; clay, p; marble, l; mines (largely undeveloped, gold, lead, silver); timber, l; waterpower, vp.

MASON: fruit, l; clams, p; fish, p; oysters, vp; copper, l; granite, p; manganese, p; timber, vp; waterpower, vp.

OKANOGAN: dairies, p; fruit, vp; livestock, vp; oats, p; wheat, p; wool, p; cement material, p; clay, vp; mines (arsenic, copper, epsom salts, gold, lead, manganese, molybdenum, silver, tungsten, zinc); timber, p; waterpower, p.

PACIFIC: dairies, p; clams, p; crabs, vp; oysters, vp; fish, p; clay, p; timber, vp; waterpower, p.

PEND OREILLE: grain, p; hay, p; cement material, vp; limestone, p; mines (gold, lead, molybdenum, silver, zinc); timber, vp; waterpower, vp.

PIERCE: berries, vp; fruit, vp; dairies, vp; livestock, p; poultry, vp; vegetables, vp; fish, p; clay, p; coal, vp; copper, l; granite, l; sandstone, p; timber, vp; waterpower, vp.

SAN JUAN: fruit, p; dairies, p; poultry, p; oats, p; wool, p; fish, vp; kelp, vp; cement material, vp; lime flux, vp; mines (undeveloped); sandstone, p.

SKAGIT: fruit, p; dairies, vp; livestock, p; oats, vp; fish, vp; cement material, vp; clay, p; coal, p; metals (copper, gold, iron, silver); sandstone, p; timber, vp; waterpower, vp.

SKAMANIA: dairies, p; fruit, p; vegetables, p; fish, p; mines (largely undeveloped, copper, lead, gold); timber, vp; waterpower, vp.

SNOHOMISH: fruit, p; dairies, vp; poultry, vp; fish, vp; cement material, vp; clay, p; coal, p; granite, p; limestone, p; marble, p; mines (largely undeveloped, arsenic, copper, lead, gold, iron, molybdenum, zinc); timber, vp; waterpower, vp.

SPOKANE: barley, p; berries, vp; dairies, vp; fruit, vp; livestock, p; oats, vp; poultry, vp; vegetables, vp; wheat, vp; clay, vp; granite, p; marble, l; mines (iron, lead, tungsten); silica, p; timber, l; waterpower, vp.

STEVENS: dairies, p; fruit, p; livestock, p; poultry, p; oats, p; wool, p; cement material, p; clay, p; granite, p; lime flux, p; limestone, p; marble, vp; mines (copper, gold, iron, lead, silver, tungsten, zinc); timber, p; waterpower, vp.

THURSTON: fruit, p; dairies, p; oats, p; poultry, p; clams, p; oysters, vp; coal, p; sandstone, vp; timber, vp; waterpower, p.

WAHKIAKUM: dairies, p; fish, vp; timber, vp; waterpower, vp.

WALLA WALLA: dairies, p; barley, vp; oats, p; vegetables, vp; fruit, vp; livestock, p; poultry, p; wheat, vp; wool, vp; clay, p.

WHATCOM: fruit, p; dairies, vp; livestock, p; oats, p; poultry, p; vegetables, p; fish, vp; cement material, p; clay, vp; coal, p; gold, l; marble, l; sandstone, p; timber, vp; waterpower, vp.

WHITMAN: fruit, p; barley, vp; dairies, p; livestock, vp; oats, vp; poultry, vp; wheat, vp; wool, vp; clay, p; gold, l; granite, p.

YAKIMA: berries, vp; dairies, vp; fruit, vp; livestock, vp; oats, p; poultry, vp; sugar beets, vp; vegetables, vp; wheat, p; wool, vp; clay, p; gold, l; silica, p; timber, l; waterpower, vp.

	COUNTY	County Seat	Area (square miles)	1910 Population	School Population, 1917	No. of Incorporated Towns	No. of Banks	Miles of Steam Railroads in Mileage and Fractions	Actual Value of Property, 1917	Chief Resources and Industries
1	Adams	Ritzville	1,912	10,920	3,160	6	7	335.774	$53,250,672	Wheat Raising.
2	Asotin	Asotin	606	5,831	1,777	2	5	None	10,332,265	General Farming, Dairying.
3	Benton	Prosser	1,671	7,937	2,470	3	7	208.461	30,610,877	General Farming, Horticulture, Stock.
4	Chelan	Wenatchee	2,900	15,104	4,616	5	8	163.273	40,179,673	Horticulture, General Farming.
5	Clallam	Port Angeles	1,726	6,755	2,320	2	4	76.557	28,333,508	Lumbering, Fishing.
6	Clarke	Vancouver	634	26,115	7,841	6	9	116.042	43,468,678	Prunes, Lumbering, Dairying, Farming.
7	Columbia	Dayton	858	7,042	1,908	2	3	88.651	22,564,193	Stock, Fruit, Grain.
8	Cowlitz	Kalama	1,153	12,561	3,708	4	5	88.656	31,259,520	Lumbering, Dairying, Fishing.
9	Douglas	Waterville	1,787	9,227	3,134	3	6	92.201	29,304,580	Wheat, Fruit, Diversified Farming.
10	Ferry	Republic	2,220	4,800	1,333	1	2	128.207	7,398,647	Dairying, Stock Raising, Mining, Farming.
11	Franklin	Pasco	1,206	5,153	1,579	3	6	241.002	25,256,100	Wheat Raising.
12	Garfield	Pomeroy	694	4,199	1,350	2	2	18.220	14,102,743	Grain, Diversified Farming.
13	Grant	Ephrata	2,720	8,698	2,685	7	9	248.270	37,323,539	Wheat Raising, Stock, Fruit.
14	Grays Harbor	Montesano	1,927	35,590	9,427	8	9	208.394	83,287,404	Timber, Manufacturing, Dairying.
15	Island	Coupeville	208	4,704	1,596	2	3	None	4,302,928	Dairying, Fruit, Fishing.
16	Jefferson	Port Townsend	1,747	8,337	1,573	1	2	37.914	16,756,682	Lumbering and Fishing.
17	King	Seattle	2,111	284,638	67,051	17	55	838.943	579,416,786	Shipping, Manufacturing, Farming, Coal.
18	Kitsap	Port Orchard	371	17,647	5,889	4	6	None	16,417,015	Lumbering, Stock Raising, Farming.
19	Kittitas	Ellensburg	2,829	18,561	5,032	4	7	281.520	50,092,287	Coal Mining, Farming.
20	Klickitat	Goldendale	1,825	10,180	2,743	2	6	165.785	34,964,660	General Farming, Horticulture, Stock.
21	Lewis	Chehalis	2,389	32,127	11,265	8	12	224.968	57,475,576	Lumbering and Farming.
22	Lincoln	Davenport	2,392	17,539	5,766	8	15	204.203	63,946,096	Wheat Raising, Farming.
23	Mason	Shelton	930	5,156	1,387	1	1	42.958	14,290,071	Oysters, Logging, Dairying.
24	Okanogan	Okanogan	5,221	12,887	4,800	8	16	150.345	21,169,127	Stock Raising, Farming, Horticulture.
25	Pacific	South Bend	895	12,532	3,905	3	3	99.504	34,480,726	Shell Fish, Timber, Farming.
26	*Pend Oreille	Newport	1,395	.....	1,506	3	3	100.089	14,151,200	Mining, Lumbering, Farming.
27	Pierce	Tacoma	1,701	120,812	31,303	13	15	484.751	186,674,225	Shipping, Manufacturing, Farming, Berries.
28	San Juan	Friday Harbor	178	3,603	1,040	1	1	None	3,953,232	Lime, Fishing, Farming.
29	Skagit	Mount Vernon	1,774	29,241	8,804	9	16	183.048	51,286,449	Cement, Lumbering, Dairying.
30	Skamania	Stevenson	1,685	2,887	783	1	1	49.428	12,987,673	Lumbering, Fishing.
31	Snohomish	Everett	2,064	59,209	16,006	12	17	417.096	96,575,824	Lumbering, Manufacturing, Fishing.
32	Spokane	Spokane	1,756	139,404	33,225	10	28	546.795	285,179,639	Manufacturing, Agriculture, Mining.
33	Stevens	Colville	2,471	25,297	6,167	6	10	142.107	29,234,398	Mining, Lumbering, Farming.
34	Thurston	Olympia	709	17,581	5,519	4	3	229.646	34,833,432	Oysters, Farming, Lumbering.
35	Wahkiakum	Cathlamet	267	3,285	1,049	1	1	None	4,560,846	Lumbering, Fishing, Farming.
36	Walla Walla	Walla Walla	1,265	31,931	7,331	3	10	322.928	76,840,873	General Farming, Stock Raising, Wheat.
37	Whatcom	Bellingham	2,082	49,511	15,543	6	10	201.345	69,068,616	Farming, Lumbering, Fishing.
38	Whitman	Colfax	2,108	33,280	10,164	17	33	512.480	114,187,336	Wheat, General Farming.
39	Yakima	Yakima	5,059	41,709	13,567	8	19	264.993	74,111,867	Horticulture, Farming, Stock.
	Totals		66,836	1,141,990	310,333	206	375	7,514.554	$2,408,921,908	

* Organized, 1911; part of Stevens county.

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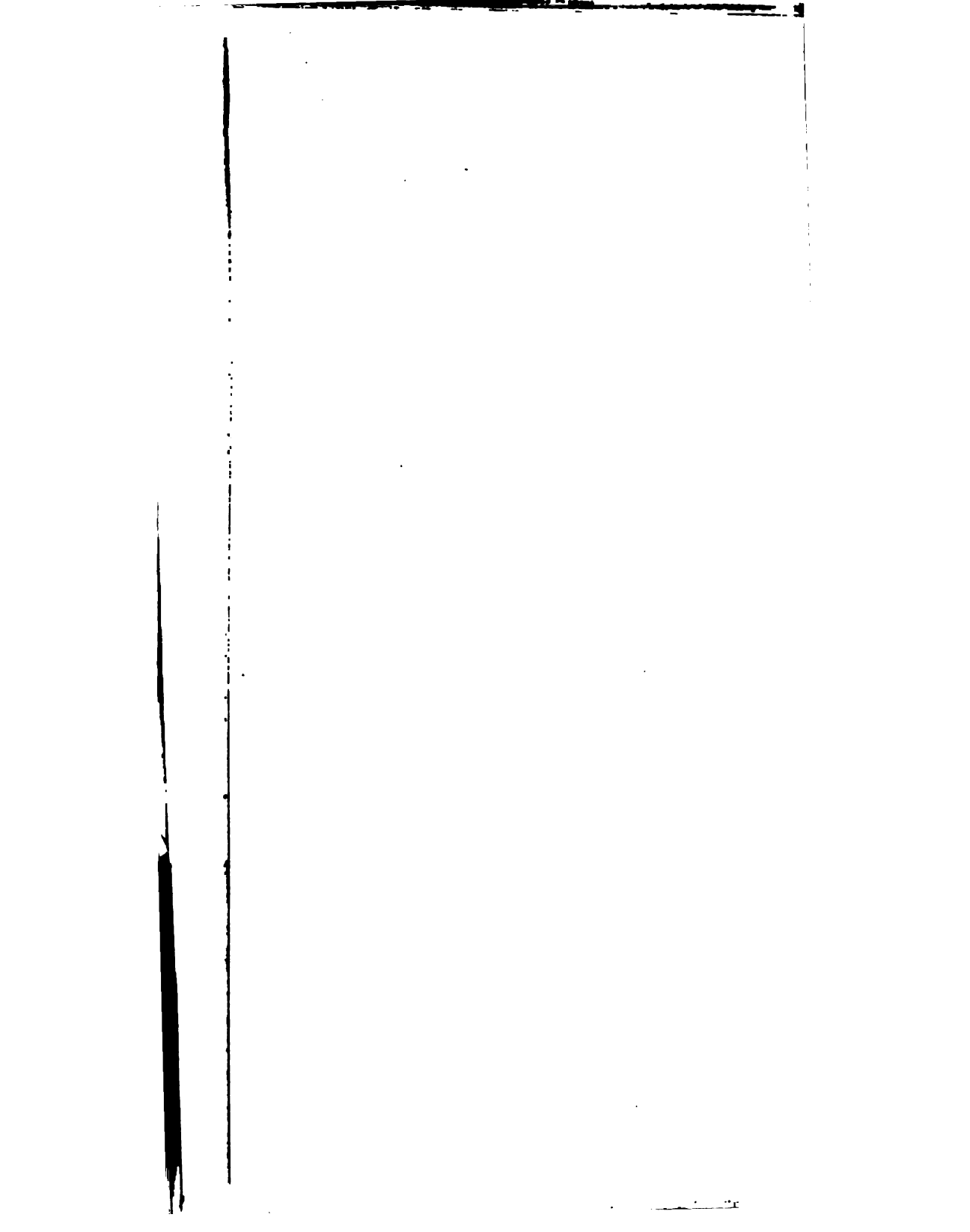

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